The Newspaper of Information Systems Management
February 12, 1996, Vol. 30, No. 7, 134 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Survey: Users seek benchmark options

By Julia King
and Dan Richman

On the credibility meter, users rank vendors' hardware and software benchmarks right up there with one-week diet plans and overnight cures for baldness.

In a recent *Computerworld* survey of 100 information systems professionals, only half said they bother to look at vendor benchmarks before buying new technology. Another 40% cast a highly skeptical eye on them.

"I don't believe in this 'trust me' crap. You can't take any numbers at face value," said Allan Friedman, vice president of technology at Bankers Trust Corp. in New York.

The upshot is that some users, including Friedman, run their own benchmarks in-house (see story, page 30). For relational database management systems, 26% of the users surveyed conduct homegrown tests.

COMPUTERWORLD SPECIAL REPORT
Benchmarks

Most companies spend up to 2% of their IS budgets on benchmarking, the *Computerworld* survey found. About 40% spent less than $10,000 last year, and another 40% spent between $10,000 and $50,000.

Another popular option is to turn to standardized benchmarks from vendor consortia, which a whopping 81% of the users surveyed do regularly. These consortia include the Transaction Processing Performance Council in San Jose, Calif., and Standard Performance Evalua-

Benchmarks, *page 30*

NT potholes

Users delayed by management tool gaps; fixes promised

By Laura DiDio and Patrick Dryden

The lack of several basic management capabilities in Windows NT Server is stalling some users' efforts to deploy the Microsoft Corp. system across large enterprises.

And a paucity of tools and utilities from third parties is also hampering efforts to manage NT servers and domain directories, interviews last week with more than a dozen users, analysts and systems integrators confirmed.

"We learned to live with it. But our staff took for granted all the [management] capabilities we had in the Unix environment, such as batch tools for scheduling jobs like backup," said Carl Parramore, chief of the systems and networking division at the National Security Council in Washington.

Microsoft and third-party vendors have tools and utilities on the way this year that they hope will alleviate the confusion and fill in the gaps. In the meantime, frustrated users have to troll the Internet for unsupported utilities and make do

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SCO, HP pitch unified Unix

By Craig Stedman

SCO, Inc. and Hewlett-Packard Co. are enlisting other server vendors to gang up on rivals Sun Microsystems, Inc. and IBM by backing a merged 64-bit Unix, due in 1998. But some users and analysts said the effort may be tantamount to tilting at windmills.

Sources close to SCO said NEC Corp. will announce at UniForum '96 in San Francisco this week its plans to port the SCO/HP operating system to Silicon Graphics, Inc.'s MIPS architecture. SCO and HP are designing the operating system for the P7 microprocessors that HP and Intel Corp. are developing.

But SCO's base is in small shops that are natural targets for Windows NT, said Jim Hurley, an analyst at Aberdeen Group, Inc. in Boston. "I don't believe for a second" that the SCO/HP team will be able to

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WHAT'S INSIDE

- Network managers such as Scott Parker (above) at Atlanta's Turner Broadcasting are turning to event correlation software to handle the rising tide of status alerts. **See stories, page 28,** *by Patrick Dryden.*
- Cryptography experts warn the banking industry that its favorite data encryption method is at risk. **See story, page 6,** *by Gary Anthes.*
- Packard Bell takes aim at the corporate market by buying Zenith Data Systems. **See story, page 10,** *by Jaikumar Vijayan and Stewart Deck.*

Cabletron blitz to build ATM muscle

By Bob Wallace

Cabletron Systems, Inc. is set to detail a comprehensive ATM product strategy designed to give users one-stop shopping for all their high-speed networking needs — from basic plumbing to the wide-area network backbone.

The Rochester, N.H., vendor said the product barrage will be formally launched by the end of the month, with most of the offerings due in three to six months. The Asynchronous Transfer Mode portfolio will give Cabletron a more complete ATM lineup than rivals 3Com Corp., Cisco Systems, Inc. and Bay Networks, Inc.

3Com doesn't have ATM products across either of its switching hub lines, and Cisco offers only backbone and WAN-access ATM products. Bay is working on ATM switching but doesn't have a single ATM plan for all its hubs.

ATM is an emerging switching technology that is faster and can support higher speeds than most of today's switching gear. ATM switches data, video

Cabletron, *page 15*

'Stealth E-mail' poses corporate security risk

By Gary H. Anthes

Anonymous remailers on the Internet are emerging as a threat to national and corporate security, some experts warn.

These remailers are Internet sites that strip the names and addresses from electronic-mail messages before passing them along anonymously to people or newsgroups.

For corporate information systems managers, stealth E-mail is especially troubling because it allows hackers to attack systems, steal trade secrets and broadcast them worldwide without leaving an audit trail for authorities to follow.

"Anonymous remailers have a lot of nasty potential," said Stephen T. Kent, chief scientist for security technology at BBN Corp. in Cambridge, Mass. "They have the broadcast potential of the news media but without the possibility of recourse if something unsubstantiated or defaming is published."

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Newspaper

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Inside Computerworld

Feb. 12, 1996

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Apple is not engaged in merger talks with anyone, the vendor's new CEO declared last week.

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You wouldn't have to upgrade those PCs if users did a little housecleaning on their hard disks. Humorist Chris Miksanek has a plan.

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It's a squishy word for the important job of being a go-between for business clients and software developers, says Michael Schrage.

98 An Apple user's saga
Amgen, a leading Apple customer, is frustrated by the prospect that the vendor may turn its back on business users, Charles Babcock reports.

The lure of a cheap ISDN line drew him in.

Before he knew it, tech dude Jim Volstad had alienated his boss, his girlfriend and his cat. Was the promise of 64K bit/sec. voice and data channels worth it?

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Love blooms in IS. *To celebrate Valentine's Day, we toss bouquets to couples who met in that unlikeliest of places, the data center.*

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Hewlett-Packard is finally catching up in the key area of Unix clustering technology.

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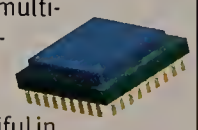

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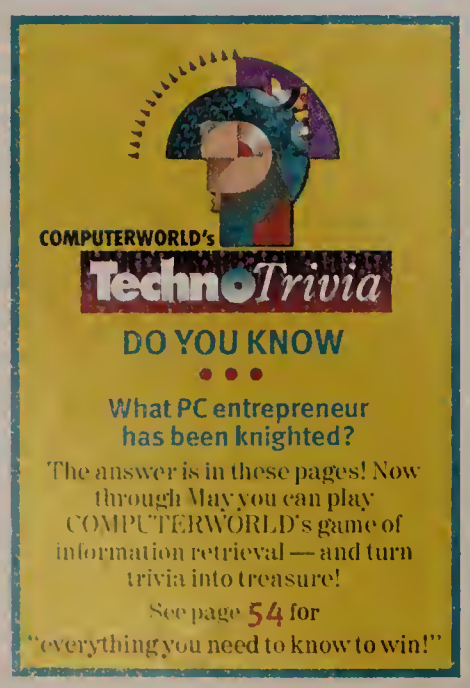

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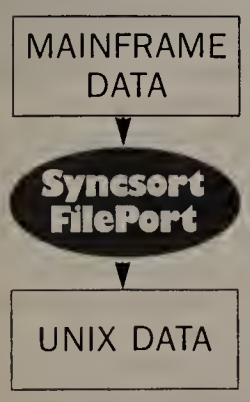

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Obscureware

Race through spreadsheets in the Netsurfer chair

What happens when you combine a computer, a motorcycle, a surfboard and a divan? You get the Netsurfer chair, which lets you zoom along the information superhighway with the wind in your hair, a mouse in your hand and all that computer horsepower beneath you. The Netsurfer was created by two 27-year-old Finnish designers — Ilkka Terho and Teppo Asikainen — and is available from Design Finland in Los Angeles. But the accounting department may not like the price tag, which is $3,490 (not including the CPU, speakers and mixed metaphors).

News to ponder

One of the hot jobs of the future will be "cybernotaries," who will attest that the documents of electronic commerce are authentic and valid, according to *The National Law Journal* in New York.

Internet threads

Compiled from Usenet's alt.folklore.computers

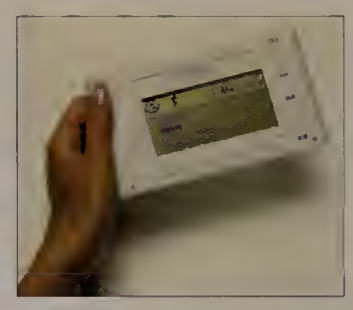
You know you've been working at the computer too long when . . .

- A fly lands on your screen, and you try to brush it away with the mouse cursor.
- You get E-mail from someone asking a yes/no question and try to reply with "y" or "n."
- You find you've ingested more than 20 cans of Jolt cola in six hours, and time has no meaning anymore.
- You get into a new car, can't figure out how to turn on the windshield wipers and wonder how to get Help.

3M builds a better mouse pad

3M has rolled out a $15 mouse pad that was designed to produce more accurate mouse performance. The 3M Precise Mousing Surface uses "microreplication" technology that creates tiny rows of peaks and valleys on the surface. The mouse gets a grip on the peaks. Hand oil and dust falls into the valleys.

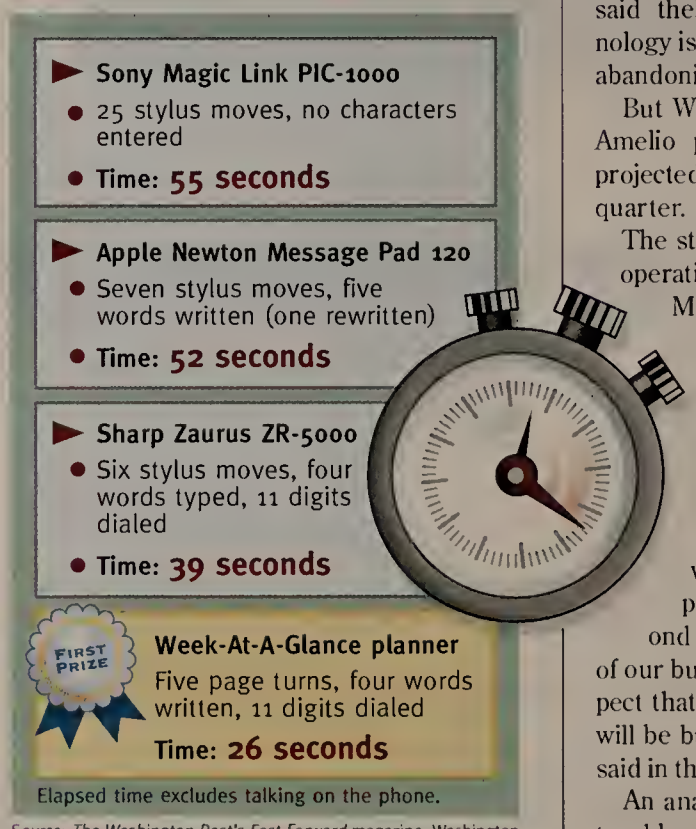
■ **Send contributions of off-beat news, lists and anecdotes to mbetts@cw.com.**



Government health authorities are trying to get Americans to stop crash-dieting and go for "slow and steady" weight loss via a healthy diet and exercise. So PICS in Reston, Va., has developed a handheld computer (above) that guides users in a no-nonsense fitness program.

Human factors

Like the old races between steam engines and horse carriages, a Washington technology magazine recently pitted some $500 personal digital assistants against the old-fashioned, $5 Week-At-A-Glance planner — you know, the black notebooks that are near the school supplies at Wal-Mart. The test: Look up a person's phone number, call him and schedule lunch for next Monday. The results are below (see chart), but let's just say it doesn't look too good for our electronic pals.



Source: *The Washington Post's Fost Forword* magazine, Washington

factoid of the week

More rural hospitals are using "telemedicine" technologies — such as teleradiology and interactive video — to consult with medical specialists at urban hospitals. A survey of 2,365 rural health facilities shows that 29% have adopted telemedicine programs or plan to do so by the end of the year.

Source: Abt Associates, Inc., Cambridge, Mass.

Apple CEO: No sale, new losses

By Lisa Picarille

Apple Computer, Inc.'s new chairman moved quickly late last week to crush reports that the company is for sale.

Apple Chairman Gilbert Amelio also warned investors that Apple may lose more this quarter than it did the previous quarter, when it lost $69 million.

Fearing that merger rumors would have a "destabilizing effect" on Apple's business, Amelio took the unusual step of issuing a statement in which he denied the reports that have been featured prominently in business and trade newspapers in the past two weeks.

Amelio, the former CEO of National Semiconductor Corp., replaced ousted Apple CEO Michael Spindler two weeks ago.

Apple officials implied that reports of a buyout were scaring away buyers and driving down stock. Apple's stock fell 1⅜ last Wednesday after more reports surfaced about Apple/Sun talks.

Despite Amelio's fears that Apple's recent spate of problems has scared off customers, dozens of users at large corporate Macintosh sites interviewed by *Computerworld* over the past month said their investment in Apple technology is too big for them to think about abandoning it.

But Wall Street may not be so loyal. Amelio pulled no punches when he projected Apple's performance this quarter.

The statement said Apple expects an operating loss in the quarter ending March 30 that "will significantly exceed" the $69 million loss incurred during the Christmas quarter. That quarter traditionally is Apple's best of the year.

"I want to emphasize my strong belief, despite the obvious disappointment of our performance in the first and second quarters, that the foundations of our business are sound. . . . I fully expect that our customers' grandchildren will be buying Apple products," Amelio said in the statement.

An analyst praised Amelio's decision to address these issues head-on.

"I think [Apple] really had to do it for some pretty basic reasons," said Eugene Glazer, an analyst at Dean Witter, an investment banking firm in New York. "When it became clear that there wasn't going to be an acquisition, it was almost an obligation to indicate there are no current discussions going on."

More important, he said, it is in the company's best interest to allay customers' fears, since some are deferring purchases or even going elsewhere to buy computers. But Glazer said not to expect this kind of public frankness from Apple in the future.

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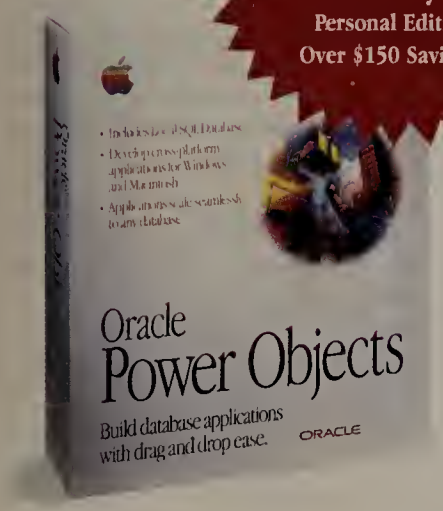

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Integrated SQL database	Yes	Yes
Industry standard BASIC language	Yes	Yes
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Native Oracle 7 & SQL Server interfaces	Yes*	No
True object-oriented code reusability	Yes	No
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Standard encryption vulnerable to attack

Banking's most trusted technique for funds transfer questioned

By Gary H. Anthes

A group of the world's foremost cryptography experts last week warned that a widely used technique for safeguarding information is nearly obsolete.

The conclusions are a warning shot across the bow of the banking industry. But users seemed likely to ignore the warning, either because they don't agree they are at risk or because of the enormous expense of changing encryption techniques within the next few years.

Computer security

The cryptographers said steady increases in computer power and a trend to network computers have eroded the effectiveness of the Data Encryption Standard (DES) algorithm. The risk doesn't come from casual hackers, but from well-funded corporations and foreign intelligence agencies that are bent on economic espionage.

The banking industry uses DES to protect the integrity and confidentiality of funds transfers that total more than $2 trillion a day.

"There is a tendency to think of DES-based systems as unconditionally secure, but they are not," said Matt Blaze, a senior research scientist for computer security and cryptography at AT&T Corp.

"DES users should be seriously considering other cryptographic options, such as triple DES," Blaze said. "Triple DES" applies the DES algorithm three times and doubles the length of the 56-bit encryption key used in single DES. It makes encrypted data vastly more difficult to decipher.

But the government's refusal to allow the export of triple DES is an impediment to its use by a bank with overseas operations.

"By the end of the decade, single-round DES ought to be phased out," said Ronald R. Rivest, a computer scientist at MIT and co-inventor of the RSA encryption system.

The cryptography experts said that for $400, a casual hacker could purchase a commercially available Field Programmable Gate Array chip and program it to guess encryption keys. But even if it tried 30 million keys per second, the device would take 38 years to break a 56-bit DES key, the experts estimated.

Yet by adding many more of those chips, or by moving to faster custom-built integrated circuits, well-heeled organizations could reduce to minutes or seconds the time needed to break DES [see chart at right].

Nevertheless, the banking industry is counting on single-strength DES to protect it for at least five to 10 more years, said John Byrne, senior federal counsel at the American Bankers Association (ABA) in Washington.

Indeed, in a recent policy statement, the ABA said it wants the government to reaffirm DES as a federal information processing standard for another decade.

The banking association said a change to another encryption method "could be prohibitively costly" and could damage the industry's ability to compete for retail and multinational funds transfer business.

Panel members said they have no idea who may have the powerful parallel computers needed to crack DES. But several members said France and Japan are known to use their intelligence agencies for industrial spying.

"Those countries are technologically advanced enough, and if they wanted to do it, they certainly could afford it," Rivest said.

The cryptography panel recommended the use of 75-bit keys for data encryption today and 90-bit keys for data to be protected for 20 years. Each additional bit doubles the encryption strength.

The panel said exportable versions of U.S. encryption software, which use 40-bit keys, are hopelessly at risk. An attacker with the $400 programmable chip in his PC could crack those in just five hours, the group said.

What a price for security

Cost to crack the Data Encryption Standard algorithm

Type of attacker	Budget	Time to crack 56-bit key
Pedestrian hacker	$400	38 years
Small business	$10,000	556 days
Corporate department	$300,000	3 hours
Big company	$10 million	6 minutes
Intelligence agency	$300 million	12 seconds

Source: Cryptographers and computer scientists

Tempers flare over Web censorship

Telecom deregulation law blocks indecency on-line

By Mitch Wagner

Hormone-pumped Internet users who cruised by the *Penthouse* magazine home page last Tuesday saw the usual display of female flesh. But by Wednesday, many of the nude photos had been removed.

Instead, there were little black squares that read, "Image is removed in accordance with U.S. Internet censorship laws. Please tell your member of Congress how you feel about Internet censorship."

Graphic displays of sex and nudity became illegal last week after President Bill Clinton signed into law the Telecommunications Competition and Deregulation Act, which contains a provision that blocks indecency on-line.

No censorship

Penthouse's competition, *Playboy*, also has a site on the Internet and also opposes the anti-indecency regulation. "It's not a wise course. It's shocking. It's disturbing. This is Puritanical; it's divisive — I don't have words enough," said Eileen Kent, vice president of new media at Playboy Enterprises, Inc. in Chicago.

Civil libertarians who oppose the law say there should be no more restriction on free speech than there is in books. They also say the law is overly broad and confusing and could be interpreted as banning any use of risque language or nudity on-line, including news reports, legal documents, literature and even the Bible.

However, supporters of the legislation say it is necessary in order to protect children from being exposed to pornography on-line.

They say the law specifically goes after material that is patently offensive and depicts sexual activity.

Many companies on the 'net, such as Yahoo Corp. in Mountain View, Calif., last week protested the legislation by turning their pages to black with white lettering for 48 hours of "virtual mourning." Meanwhile, the American Civil Liberties Union, the Electronic Frontier Foundation and other critics filed a federal court complaint to block enforcement of the law.

Scott Woelfel, vice president and editor in chief at CNN Interactive, said the law is troubling. "I think that the Congress and members of the Senate who passed this bill don't really understand what the Internet is about. I think there are other ways to address this problem," he said. CNN Interactive is produced by Turner Broadcasting, Inc. in Atlanta.

Look of the future? *This on-line Playboy image, which we blocked, could end up censored by the government under the new telecommmmunications law*

Miramax site

Miramax Films Corp. in Los Angeles, offers two versions of its site to promote the movie *From Dusk Till Dawn*. One version contains graphic material and language, while a tamer version illustrates the effects of the law.

Miramax officials said they don't intend to bring down the raunchier version of the site after the law takes effect. "We're not sure what will really take place and how vigilant the government will be in pursuing violators," said David Glickman, manager of interactive media at Miramax Films.

Corrections

In the Buyer's Guide to Notebook PCs [CW, Jan. 15], the telephone number for AST should have been listed as (800) 876-4278. The review for Gateway 2000 Solo S120 should have said that its power management capabilities are accessed by CMOS settings and use a 2.9V power supply.

******

The Alabama Commission on Higher Education has no official records or knowledge of the World Association of Colleges and Universities or the American Institute of Computer Sciences [CW, Dec. 11]. The agency tracks only schools accredited by the Education Department.

******

The starting salary for 1995 Information Systems MBA grads at the University of Minnesota published in the Top 25 Techno MBAs article [CW, Dec. 4] was incorrect. The correct figure is $49,229.

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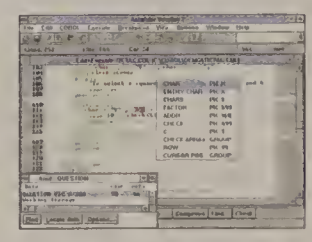

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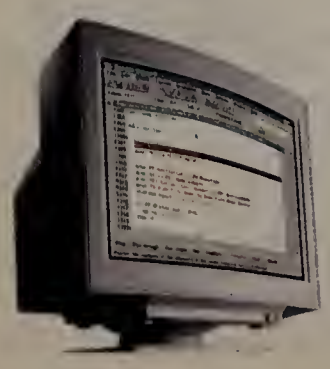

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Users take ISDN ordering in hand

By Neal Weinberg

Frustrated by the lack of standards coming out of the North American ISDN Users Forum, two splinter groups have sprung up, each trying to make it easier for users nationwide to obtain ISDN service.

"It's a bit confusing, to say the least," said James Y. Bryce, an Integrated Services Digital Network (ISDN) user and consultant in Austin, Texas. He said interest in ISDN has skyrocketed, especially for Internet access and telecommuting. But the key inhibitor to wider deployment has been the difficulty in ordering it.

The user forum is working on a standard ordering code for ISDN, but "the feeling of the industry folks is that they are not moving fast enough," Bryce said.

Simplified ordering is needed so users can avoid what Matt Griffin, supervisor of information systems at PTK Management in Boone, N.C., went through.

"It was probably one of the worst professional experiences I ever had," Griffin said. When he called BellSouth Corp. to order the service, he was asked, "ISDN what?"

He finally spoke to someone familiar with ISDN, who asked technical questions that forced Griffin back to his equipment vendor. During the installation process, he had engineers from BellSouth and his equipment vendor on site repeatedly. And at one point, he had to tear out one vendor's equipment because it wouldn't work with the BellSouth line.

All in all, it took three months from the date he ordered the service to get it operating. That's exactly the type of horror story that prompted Bill Smith, vice president of broadband services at BellSouth Business Systems, to create an unnamed splinter group last November to develop its own set of ordering codes for regional Bell operating companies across the country.

Requests for home ISDN in the Atlanta area are expected to surge during the Olympics, and Smith said he was under intense pressure to get the codes implemented. The schedule laid out by the user forum was too slow, he noted.

Smith and his group have broken down ISDN ordering into four basic packages: Internet user, Internet user with voice mail, work-at-home user and work-at-home user with voice mail. He also is trying to create a registered name, such as Easy ISDN, that would be standardized across the country.

A second splinter group, calling itself the ISDN Forum, emerged last month to attack the same problem from the equipment side. William Hetherman, product manager for AT&T Corp.'s digital long-distance service, said the ISDN Forum wants to ensure that ISDN equipment that resides at the user site automatically connects to the AT&T switch at the telephone company's end.

Richard L. Raybold, an ISDN consultant in Great Falls, Va., said the goal of each group — no-hassle, plug-and-play ISDN — is laudable. But Raybold noted that each is off on a separate track.

The two splinter groups said they intend to bring their completed specifications back to the North American ISDN Users Forum.

"I'd like to see it standardized somewhere," said Mark Sarles, a stock broker at A. G. Edwards, Inc. in Seattle. He said when he tried to order ISDN about 18 months ago, the US West people responded with, "Say what?"

ISDN — at any cost? See page 75.

Splinter groups

These groups broke away from the North American ISDN Users Forum:

Name	Members	Goal
ISDN Forum	Lucent Technologies (formerly AT&T Network Systems), Ascend, 3Com, U.S. Robotics	To make ISDN equipment plug and play
No formal name	BellSouth, Ameritech, AT&T, Intel, Motorola, U.S. Robotics, IBM	To develop standard ordering codes for ISDN

News Shorts

DOJ studies Microsoft buyout of Vermeer

The **U.S. Department of Justice** is studying **Microsoft Corp.**'s acquisition of **Vermeer Technologies, Inc.** to determine whether the deal gives Microsoft an unfair advantage in the blossoming Internet development tools market. The department has requested documents related to the deal from Vermeer, the company confirmed. Separately, Microsoft clipped the wings of its Blackbird on-line development tools. Rather than gear the product toward both The Microsoft Network and the Internet, Microsoft now will focus only on the Internet.

Cisco unveils Web products

Internetworking power **Cisco Systems, Inc.** last week announced two software packages that will let users cope with excessive demand on Internet servers. The vendor's CiscoAdvantage LocalDirector software lets users load-balance incoming calls across multiple local servers at one World Wide Web site. DistributedDirector lets them spread calls across geographically dispersed servers. The packages will ship by the end of March; no pricing was announced.

Oracle wins $25M contract

Continuing on its roll of winning megadeals, **Oracle Corp.** last week announced a $25 million contract with the Department of Defense, which will use the vendor's Human Resources application to manage the records of some 800,000 civilian employees and another 1.2 million military personnel.

Faster Unix apps on tap

At UniForum this Wednesday, **Information Builders, Inc.** is expected to announce Version 6.8 of its Focus 4GL for Unix. Set to ship by July for major Unix platforms, the version will write applications that run 100% faster than those written with earlier versions, the company claimed. The performance boost comes in part from allowing concurrent read-and-write access to the same database, the New York company said. Focus 4GL for Unix 6.8 will list for $3,000 per single user.

The Web site, "24 Hours in Cyberspace"

A Day in the Cyberlife

Tipper Gore and 1,000 other photographers worldwide captured digital images to reflect a day of on-line living last Thursday for "24 Hours in Cyberspace" (http://www.cyber24.com). The site includes first-person accounts of how the Internet has changed lives. Grade-schoolers in Osaka, Japan, for example, have linked distant classrooms via the Internet for a lesson in shared learning. Industry celebrities also shared their thoughts on how the Internet has changed humankind.

Cheyenne gives antivirus shot

Cheyenne Software, Inc. will ship a new version of its InoculAN 1.01 antivirus software for Windows NT this week, following the discovery of a design flaw that puts Windows NT installations at risk. Currently, anyone can use a preset, unencrypted password to gain entry to the system. Cheyenne, in Roslyn Heights, N.Y., started shipping the Windows NT version of InoculAN several months ago.

Brightman resurfaces

Richard W. Brightman

Lib/Go, Inc., the Ramsey, N.J., parent company of Liberty Travel, Inc. and Gogo Worldwide Vacations, Inc., has named Richard W. Brightman vice president of information services. Brightman, who was previously director of information systems at RJR Nabisco, Inc. in New York, replaced Robert Dever.

Secure EDI over the Internet

GE Information Services introduced GE InterBusiness, a service designed to let member companies conduct secure business-to-business transactions over the Internet. The service uses secret key cryptology in a mutual authentication environment to secure transmissions.

IBM pushes NT projects

IBM is accelerating the delivery of several Windows NT-based pieces of its answer to Microsoft Corp.'s BackOffice. An NT version of IBM's product, dubbed Project Eagle, wasn't due until late this year, but IBM now plans to have database, Notes and Internet connection servers ready within 60 days of the suite's scheduled March introduction at the CeBit conference in Germany. Versions for IBM's own AIX and OS/2 will be introduced in March.

On-line price wars erupt

CompuServe, Inc. said last week it is immediately offering unlimited Internet access for $20 per month. Next month, **Prodigy Services Co.** plans to launch a pilot program that gives the New York metropolitan area Internet access for $1 per hour, with no minimum charge. Though not the cheapest Internet services, these would be the least expensive offered by the well-known national on-line players.

Macro viruses turn dangerous

Macro viruses are no longer harmless curiosities but have become a significant threat to PC users of Microsoft Corp. or Macintosh software, according to the **Computer Incident Advisory Capability** (CIAC) at Lawrence Livermore National Laboratory in Livermore, Calif. To protect themselves from the viruses, which can destroy files, users should scan new documents for viruses just as they would new software, the CIAC recommended.

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Packard Bell seeks corporate boost

Consumer PC king buys Zenith Data for market presence

By Jaikumar Vijayan and Stewart Deck

Consumer PC market leader Packard Bell Electronics, Inc. has acquired Zenith Data Systems from Groupe Bull in a $650 million deal that will propel the merged entity to the top spot in the U.S. PC market.

The deal was designed to boost two distinct market efforts: Packard Bell's bid to become a contender for corporate sales via access to Zenith Data's mostly corporate clients and its distribution partners and efforts by NEC Corp. — which holds a 20% stake in Westlake Village Calif.-based Packard Bell — to expand its presence in the U.S. market.

But so far the deal is a big yawn to some corporate users, who were quick to note that Packard Bell will have to shed some weighty baggage before it can hope to win over business accounts.

Besides cleaning up a bad reputation for support, the company has been in dire financial straits recently. Both situations are likely to be off-putting to information systems managers.

Desktop merger

"[We have] heard too many horror stories about support experiences and products to consider buying anything from [Packard Bell].

PC potluck

Packard Bell and Zenith Data Systems bring the following pluses to the merger:

Zenith Data Systems	Packard Bell
■ A presence in the corporate and government markets	■ A large presence in the consumer market
■ Distribution into corporate markets	■ A large consumer customer base
	■ Good retail relationships

They don't have the service, the support or the reputation that companies like Hewlett-Packard Co. have," said Sean Gilbert, manager of IS at CardService International in Agoura Hills, Calif.

Image improving

"Packard Bell's name has gradually improved, and Zenith has a decent corporate reputation, although not one to shout about. But we wouldn't look into buying anything from them right now," said Ian Stewart, manager of MIS at Fish and Richardson, a law firm in Boston.

Straightaway, however, the merger will pump some much-needed cash into the financially strapped Packard Bell.

Almost every cent of Packard Bell's estimated $4 billion in revenue last year came from the home market, where wafer-thin margins and increased competition from well-funded rivals such as Compaq Computer Corp. and HP have put enormous financial pressure on the privately held company.

Inventory overflow

Adding to Packard Bell's woes has been a rapidly bloating inventory of unsold, low-end Pentium systems, which many analysts claim caused the company to renege on a $470 million payment to chip maker Intel Corp. last quarter.

Mal Ransom, Packard Bell's vice president of marketing, denied there were inventory problems and refused to comment on the Intel issue.

Under the complex agreement, Packard Bell will get $650 million from NEC and Bull and acquire Zenith Data from Bull. Currently, Bull and NEC jointly own about 40% of Packard Bell's shares.

In return for this investment, NEC and Bull will receive preferred stock that is both redeemable and convertible to common stock.

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Taking a unified view

HP to integrate OpenView with systems management tools

By Patrick Dryden

Hewlett-Packard Co. this week will announce plans to integrate OpenView, the market-leading network manager, with its systems management tools, enabling one unified view of both hemispheres of a client/server world.

Network management

This integration will let administrators fix problems more easily, but it appears HP may be jumping the gun a bit for some sites. Others will likely balk at the price tag.

HP plans to offer two versions of OpenView that combine network and systems management.

The packages — which start at $40,000 and $26,000, respectively — were designed to empower members of both management groups within an information technology organization. But support groups are only just beginning to recognize a need for such help, and sticker shock may hit hard.

"Separate operators deal with systems and networks, and their responsibilities preclude immediate need for integrated management," said Rick Sturm. He is a member of the technical staff for management at US West Communications, Inc. in Denver. "Now they just pick up the [telephone] and ask each other about alerted problems," Sturm said.

Most OpenView users rely on the network management tool that forms the foundation for management offerings from HP and other vendors. Several echoed Sturm's disinterest because of separation of support groups.

Even though management responsibilities keep these two groups and LAN managers separate within most large organizations, they all could benefit from sharing their tools and data, said Christine Curtis, a consultant at Northeast Consulting Resources, Inc. in Boston.

Systemwide view

HP's move could help systems managers who need to see beyond the databases, operating systems and servers to get a full view of performance factors, Curtis said.

When administrators receive complaints about slow application response, for example, they must be able to check several possibilities, such as a congested LAN segment, faulty router or sluggish server.

"[Information technology] departments still specialize, but this integrated OpenView gives operators the option to view what's going on in other areas without handing control over to them," said Sylvia Clark, an analyst at Aberdeen Group, Inc. in Boston. "This information sharing helps each group solve the problems they are responsible for," she said.

OpenView IT/Operations is scheduled to ship in May. It combines Network Node Manager for monitoring routers, hubs and links with OperationsCenter for monitoring systems, applications and services.

Pricing for the package will start at $40,000. Analysts say this move will help position HP in the high-end integrated management arena against systems management tools from Computer Associates International, Inc. and Tivoli Systems, Inc.

Following in June will be OpenView IT/Administration, which merges AdminCenter tools with Network Node Manager. This package also will let network operators manage user accounts, software distribution and inventory of hardware and software. Pricing will start at $26,000.

"I'd love to have this integration when we extend support to 10 field sites this year, but our budget can't take that much for management tools," said Bryan Reese, project team leader at the Office of the Inspector General of the U.S. Department of the Treasury.

1,418 days and counting

CA offers year 2000 date-change products

By Thomas Hoffman

The world's largest mainframe software vendor has weighed in with its answer for the year 2000 date-change issue. And Computer Associates International, Inc. claims to be able to do it at a fraction of most cost estimates.

CA in Islandia, N.Y., has rolled out a set of software and services designed to scan an organization's Cobol inventories and determine how long and how much it would cost to get these systems to the next millennium.

The date-change problem could cripple mission-critical business systems around the world, especially time-sensitive scheduling applications that would read 01/01/00 as Jan. 1, 1900.

CA's Discovery 2000 system includes CA-Impact/2000, a multiplatform tool that analyzes applications and lists the information needed to estimate and plan for year 2000 system changes. CA-Impact/2000 runs on mainframe (IBM MVS and VSE) and desktop platforms.

The product will cost $35,000 to $50,000 for most information systems shops, depending on the number of lines of code that have to be reviewed, according to Rich Chiarello, senior vice president of sales at CA.

For most sites, consultant services will range from $18,000 to $30,000, he added.

For organizations that seek to enlist CA's help to actually reprogram their software, those fees will span from $250,000 to $500,000 — a princely sum but still a fraction of what most chief information officers expect to shell out to handle the problem internally, Chiarello claimed.

A large New England insurer estimated it will spend $50 million to comply with the year 2000 date change, said Bill Goodwin, president of 2000AD, Inc. in New York. A banker told Goodwin that he expects to pay 50 cents for each line of code changed, or $7.5 million for 15 million lines of code.

Adpac Corp., Cap Gemini America and Viasoft, Inc. also offer date-change products.

Fresh crop

Apple's forthcoming Workgroup servers can be used as applications and Internet or AppleShare servers, depending on the software bundle chosen. Specs for these servers include the following:

	Workgroup Server 8550	Workgroup Server 7250
Chip	132-MHz PowerPC 604	120-MHz PowerPC 601
RAM	24M bytes expandable to 512M bytes	16M bytes expandable to 256M bytes
Hard drive	2G bytes	1.2G bytes
Cache	512K bytes	256K bytes
Video RAM	2M bytes	1M byte
CD-ROM drive	Quad-speed	Quad-speed
PCI	Three slots	Three slots
SCSI	Internal/external	Internal

Apple's first PCI servers happen to be its fastest

By Lisa Picarille

Aiming to quash claims that it isn't committed to big business and the enterprise, Apple Computer, Inc. is expected to roll out its first PCI-bus workgroup servers and a pair of Unix network servers at Seybold Seminars Boston '96 next month.

Enterprise servers

The Peripheral Component Interconnect (PCI) bus servers include the Workgroup Server 8550 and the Workgroup Server 7250. The PowerPC 604-based 8550 is Apple's fastest server and runs at 132 MHz. The 7250, aimed at medium-size businesses and education and publishing users, sports a PowerPC 601 processor and runs at 120 MHz, according to sources briefed about the firm's plans. Pricing information wasn't available.

"It's about time that Apple started to seriously look at what large [Macintosh] sites want," said an information systems manager at a large East Coast investment banking firm.

Apple's Workgroup Server products use the company's proprietary Nubus architecture. Apple switched to the more standard PCI bus last summer when it introduced desktop Power Macintoshes. The new servers are the first to use the PCI bus.

The new Workgroup Servers run the Mac OS and can be used for a variety of purposes, including application, Internet or AppleShare servers, depending on which software bundles — or, Server Solutions — are purchased, sources said.

The Applications Server Solution includes Apple's RAID software, Wave Research, Inc.'s FileWave file-distribution software, Datawatch Corp.'s NetOctopus and Dantz Development Corp.'s Retrospect Remote.

The AppleShare package adds AppleShare 4.2.1, Apple Remote Access MultiPort Server software and Santorini Consulting & Design, Inc.'s Server Manager administration software.

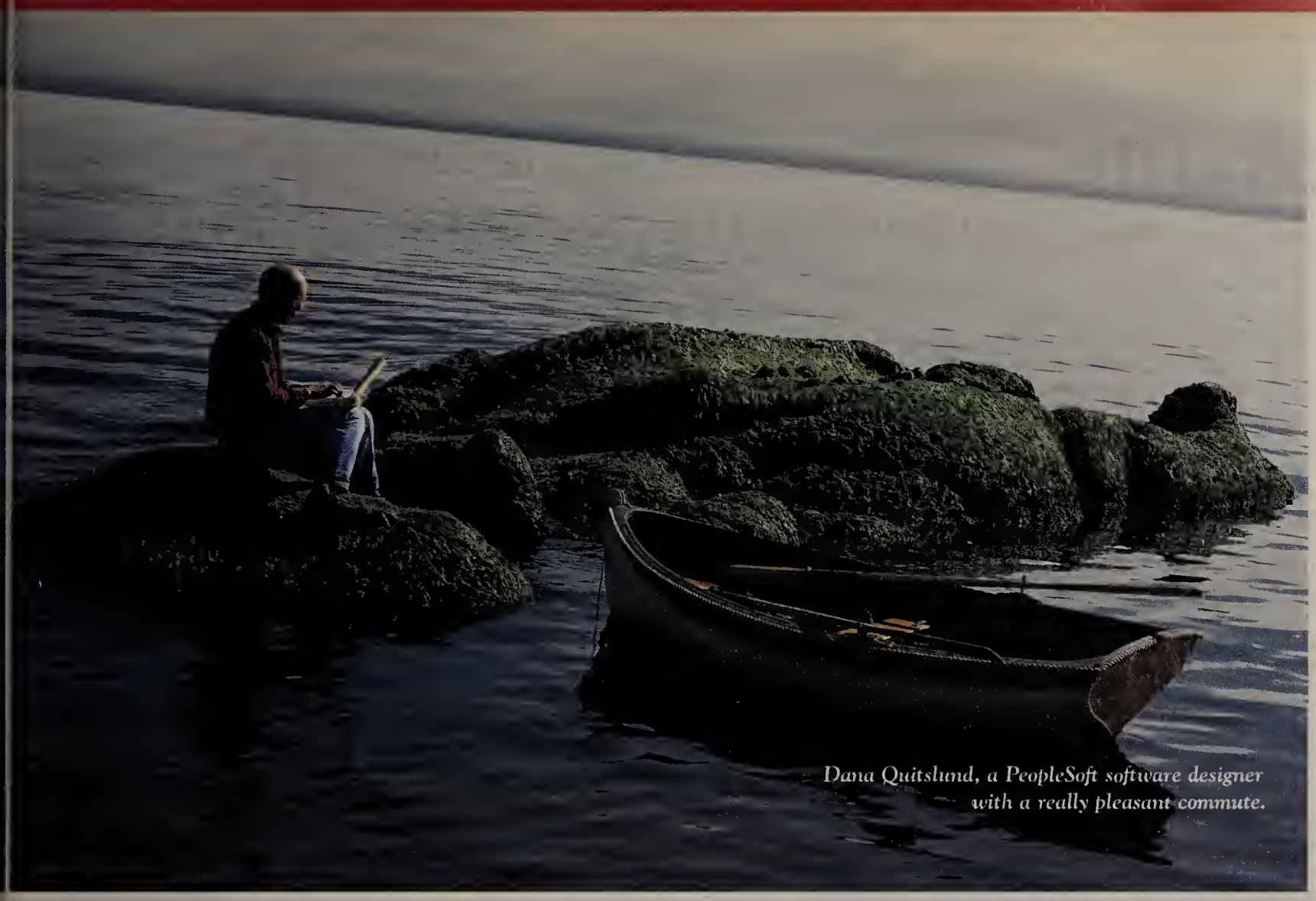
The Internet server package includes Apple's HyperCard, AppleScript, AppleSearch and RAID software; Apple's MacDNS domain name server; Adobe Systems, Inc.'s Acrobat Pro and PageMill; and StarNine Technologies, Inc's WebStar World Wide Web server.

Unix server to debut

Apple also is expected to unveil its long-awaited Unix Network server, code-named Shiner, at the Seybold conference. Shiner will be Apple's first system to run native Unix applications.

The Unix servers initially will run only IBM's AIX and later the Mac OS. They will come in two models — the Network Server 500/132 and the Network Server 700/150. Both systems are aimed at the high-end Unix server market occupied by Sun Microsystems, Inc. and Hewlett-Packard Co. They are based on the PowerPC 604 processor and come with 32M bytes of RAM.

Apple declined to comment.



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Microsoft dallies

OMG takes company to task for holding back key Network OLE information

By Frank Hayes

Microsoft Corp. still hasn't delivered key information about its forthcoming Network OLE architecture to an industry consortium, leaving savvy users frustrated by the delay.

Last October, Microsoft delivered a preliminary specification for its network-oriented object architecture to the Object Management Group (OMG), a Framingham, Mass.-based consortium that includes IBM, Hewlett-Packard Co., Digital Equipment Corp., Sun Microsystems, Inc. and other large-systems vendors.

Object technology

The specification was intended to let those vendors link Network OLE with their own object systems that conform to the OMG's Common Object Request Broker Architecture (CORBA). Many large organizations use CORBA for enterprise networks. But Microsoft, itself an OMG member, favors its own Network OLE as an enterprisewide object technology.

The Microsoft documentation leaves some key parts of the architecture unspecified or labeled TBD, for "to be decided," according to OMG documents. The group requested clarification from Microsoft early last month but hasn't yet received the additional information.

That's frustrating to large users who have been working for several years to build CORBA-based enterprise networks. "The real hassle is that last mile," the connection between enterprise networks and PCs, said a technology manager at a manufacturing company, who requested anonymity.

Some vendors have rolled out links between CORBA and versions of OLE. But Redmond, Wash.-based Microsoft isn't in a rush to publicly fill in the blanks for Network OLE, which will debut later this year as part of the shell update to Windows NT.

Microsoft officials said they are moving with all deliberate speed to respond to the OMG's request. Jeff Alger, a senior marketing manager at Microsoft, said all the ambiguities should be cleared up when Network OLE goes into beta testing — which will be in "a matter of weeks, not months."

Exodus of SAP America's president leaves its U.S. users in the lurch

By Julia King

The departure of company president Klaus P. Besier from SAP America, Inc. leaves U.S. customers without an effective ambassador to lobby on their behalf at the German parent company, several sources said last week.

SAP America executives in Philadelphia insist it will be business as usual at the client/server applications giant, but U.S. users aren't so sure.

"We knew Klaus and how he operated and of some of the battles he fought from an American point of view. He did quite a good job at communicating our needs back to Walldorf [Germany]," said SAP R/3 user Carl Moushon. Moushon is manager of process development and integration services at Steelcase, Inc., a furniture maker in Grand Rapids, Mich.

Besier resigned two weeks ago and will take over next week as CEO and chairman at Business@Web, an Internet applications development company in Cambridge, Mass.

In four years, Besier transformed SAP America from a virtual unknown to a client/server software phenomenon with revenue last year of $710 million.

It was under Besier, for example, that SAP revamped its R/3 training curriculum around U.S. business processes rather than individual SAP software modules.

Strategies for marketing R/3 to prospective U.S. companies also changed under Besier's hand.

"When SAP first came here for presales presentations, they had technical people executing every button and function key before an audience of corporate executives," Moushon recalled.

Now, by contrast, SAP America has adopted a much more customer-oriented approach, users said.

Upward shift

With the departure of Klaus P. Besier, Paul Wahl, former executive vice president of German parent company SAP AG, becomes CEO of SAP America. Jeremy Coote, former executive vice president at the U.S. unit, is now president.

The middlemen

Still other users said the vendor's American software arm has a long way to go in coordinating service and support for U.S. companies with global operations.

Now, for instance, when problems occur, U.S. customers go through SAP America to get answers from SAP software developers in Germany, said Huck Shapiro, vice president of information systems at Harman Consumer Group, an R/3 site in Chatsworth, Calif.

"That means having to wait. I'd rather deal with Germany directly and bypass SAP America," he said.

Analysts see other gaps in how SAP executives view the relationship between systems and day-to-day business operations.

"SAP is ceasing to talk about business processes. They don't talk about things like the general ledger," said Ed Black, an analyst at Aberdeen Group, Inc. in Boston.

Instead, "they talk about putting things into the R/3 system and taking them out of the R/3 system," he said.

To some SAP executives, particularly those in Germany, "the business is the R/3 system," Black said.

SAS introduces its first packaged application. See page 43.

Users shrug off Informix/Illustra server delays

By Dan Richman

Informix Software, Inc. will likely miss its year-end delivery date for the merged Informix/Illustra database server software that was announced in late December, two analysts warned.

But some users said they want the product, called Universal Server, and don't mind if it is a bit late.

"I believe [the integration] can happen within a year, and it will be very gratifying to us, as long as it's within a reasonable time," said Illustra user Harry Mendell, a vice president in the market risk department at Morgan Stanley & Co. in New York.

Informix's timetable, along with other key product details (see chart), emerged last week at a San Francisco briefing on the plan to merge its relational database management system with the object/relational DBMS from Illustra Information Technologies, Inc. in Oakland, Calif.

The Universal Server will combine Informix's scalability with Illustra's ability to handle complex data such as video, audio, images, time-series and two- and three-dimensional modeling.

Product plan

Eric Miles, head of the Universal Server lab, said the merged design will be finished by May 1 and the integration will be finished by Aug. 1. Quality assurance will continue through the fourth quarter, and the beta-testing program will continue until the software ships at the end of the year, he said.

Two analysts said they doubt Menlo Park, Calif.-based Informix can adhere to this schedule.

"It takes a year just to debug an application, and they say they'll merge a 1 million-line RDBMS with a 500,000-line server in that time? Preposterous. I say it will never really happen. Some Illustra features may find their way into Informix, but no one will settle for the performance compromises a complete integration would require," said Rich Finkelstein, president of Performance Computing, a consultancy in Chicago.

Another analyst, who asked not to be named, said, "It's a huge task, and I think they'll have a lot of trouble doing it on time."

The bigger concern, the analyst said, is whether people will want the product at all. The need to handle nontraditional data may not be as big or pressing as Informix officials think, he said.

Comparisons made

Other vendors' RDBMSs already handle nontraditional data, though perhaps not as powerfully as Illustra. And those products don't require users to master the complexities of developing for an object/relational DBMS. Illustra applications currently must be written in C or C++, so developers can't use fourth-generation languages (4GL).

"I don't find Illustra [overly complex]," said Roy Pfingsten, director of mortgage risk analytics at BancBoston Mortgage Corp. in Jacksonville, Fla. "And for really manipulating objects, with inheritance and subobjects, I think you do need an object/relational DBMS."

Tim Shetler, Informix's vice president of product management, said the company's New Era 4GL will be reworked to let users write Illustra applications, although not necessarily by year's end.

Fruits of the merger

The following products will emerge from the Informix/Illustra merger:

Name	Function	Availability
DataBlade Developers' Kit	Users can create DataBlades that will run on Universal Server	By July 1
Informix Gateway	Users can access any combination of complex data in Illustra's server and traditional data in Informix	By July 1
Universal Server	A blend of Informix's Dynamic Scalable Architecture and Illustra's technology	By Dec. 31 for Solaris, SPARC, HP-UX, Silicon Graphics' IRIX; by April 1, 1997 for Windows NT

CA unveils its object database. See page 43.

Cabletron blitz to fill out ATM lineup

CONTINUED FROM PAGE 1

and voice in standard 53-byte cells.

Analysts lauded Cabletron's strategy.

"These products will let Cabletron pull [far] ahead of the rest of the pack," said Eric Hindin, a program manager at The Yankee Group, a consultancy in Boston. "Some vendors have stand-alone ATM switches and cards, but no one has ATM products for their entire LAN switch line."

But Hindin cautioned that Cabletron still must deliver the ATM products on schedule. Some of the products will be built by Cabletron, and others will be resold under an agreement with ATM market leader Fore Systems, Inc.

Users said Cabletron's plan holds benefits compared with those of its rivals.

"We're looking for a complete ATM line, and some switching hub vendors don't even have ATM switches yet," said John Scoggin, a supervisor of network operations at Delmarva Power & Light Co. in Newark, Del. Scoggin was briefed on the announcement. "We're looking at their products and Cisco's, but Cabletron has the edge because it has integrated Fore's network management system with its own," he said.

Surveys have shown that Cabletron's Spectrum network management system is used more widely than rivals' packages.

"Another big advantage is that all the products will work with the Cabletron switching hubs we use now," Scoggin said.

Another user briefed on the Cabletron ATM announcement agreed.

"We like the Cabletron approach of putting new technology on modules that can be swapped in and out," said Tom Bartiromo, a network administrator at Bayley Seton Hospital in Staten Island, N.Y. "Other vendors build it in to the chassis, which means you have to throw out the chassis for a technology upgrade."

Bartiromo said his site is primarily a 3Com shop, but 3Com is missing some of the ATM products the hospital needs. "So there's a very good chance we'll go with Cabletron," he added.

Planned offerings include ATM modules for Cabletron's switching hub line and the SmartSwitch family it announced last fall, stand-alone ATM switches and other wares (see story below).

The planned products include the following:

- The SecureFast Cell Switch (SFCS)-200BX, which is a 2.5G bit/sec. stand-alone ATM switch that can support up to 24 clients, servers and/or LAN access devices. It has four slots.
- The SFCS-100, which is a 10G bit/sec. backbone switch that can support up to 96 clients, servers and/or ATM access devices. The switch has 16 slots.
- The Cell Transfer Matrix, which is a 75G bit/sec. backplane for Cabletron's MMAC-Plus high-end switching hub. It was designed for enterprise and carrier networks.

ATM on the way

Other Cabletron ATM products on the way include the following:

- ATM access devices that provide a high-speed uplink of up to 155M bit/sec. from the LAN to an ATM backbone network.
- SmartSwitch ATM access modules for the WorkGroup SmartSwitch and the midrange MMAC and MMAC-Plus switching hubs.
- The ATM Interworking Router Module for the MMAC-Plus is a device that will be used at the edge of a switched ATM network.
- Spectrum 4.0 with ForeView Integration is a new capability that will enable Cabletron users to launch Fore Systems' ForeView ATM network management system from a new Spectrum module.
- Cabletron is reselling Fore's entire line of ATM adapter cards for buses, including Extended Industry Standard Architecture, Peripheral Component Interconnect, Sbus, Nubus and Micro Channel. — *Bob Wallace*

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NT 4.0 gets warm reception

Remote access feature will boost communication speeds

By Stuart J. Johnston
DENVER

Members of the largest Windows NT user group in the Rocky Mountain region last week got their first glimpse of NT 4.0, along with a few unannounced additions and deletions from the operating system's final release next quarter.

Aside from the general enthusiasm about the addition of Microsoft Corp.'s Windows 95 user interface to Windows NT 4.0, the 900 attendees exhibited strong interest in a new feature called Remote Access Services (RAS) "multilink." It will let them achieve faster communication speeds.

RAS multilink will let an NT machine with multiple communications ports and modems use them all as if they were a single dial-up communications channel. That expands the actual transmission bandwidth for a telephone link.

Operating systems

RAS multilink intrigued some, but a few NT users expressed skepticism that it would be of much use to the majority of users because most won't have multiple phone lines or modems attached to their desktop machines.

Lack of lines

"Using multiple lines with RAS could be a bonus, [although] I don't know how many users have two [phone] lines," said Margaret Auld-Louie, systems administrator in the Sales Process Automation group at Learning International, Inc. in Golden, Colo.

With RAS multilink, if a user had a machine with two phone lines, two 28.8K bit/sec. modems and two communications ports, the user could combine them into a single connection of 57.6K bit/sec. by bundling the bandwidth of the two modems.

"That's an important feature for my clients because most of our servers have two modems," said Kirk A. Tylor, vice president at Innovative Quality Systems in Longmont, Colo.

One major deletion from NT may affect some users — NT 4.0 won't work on 386-based machines or on machines that use 386SX chips, said Frank Artale, group program manager for Windows NT.

New features in Windows NT 4.0

- Quickviewers, for looking at files without the programs that created them
- Autodial for Remote Access Services (RAS)
- Internet mail support
- Simultaneous use of multiple modems with RAS
- Improved OpenGL 3-D graphics support
- Office 95's document properties displayed under the new user interface

However, none of the dozen or so attendees interviewed by *Computerworld* expressed angst about the discontinuation of support for the older, slower chips. Several said they deploy NT only on Pentium PCs, eschewing even 486-based machines.

Two other features that will be missing from NT 4.0 when it ships — but will be added later this year — are built-in support for faxes and a Microsoft Network client, Artale said. Several users said they weren't particularly concerned by these omissions.

"There's a lot of good third-party fax support already [available for NT], and NT hasn't had built-in support so far, so it's not a big deal" that it will be left out for now, said Jeffrey Lathrop, an independent NT consultant and administrator of the user group's World Wide Web site.

The first of two beta test runs for NT 4.0 Workstation and Server is shipping to 120,000 users. The second will begin in late March, and final release of NT 4.0 is set for the second quarter.

Microsoft MAPI spec wins universal support

By Suruchi Mohan
ORLANDO, FLA.

Microsoft Corp. shed its veil of secrecy and talked openly for the first time about its 6-month-old MAPI Workflow Framework at the Business Process & Workflow Conference here last week.

The specification, which also is known as an extension to Microsoft's Messaging Application Programming Interface (MAPI), was formally made available at the conference. The framework is the company's attempt to define a standard way for users to route and track workflow information.

Spec specs

MAPI Workflow Framework includes the Command Message Interface, which lets systems exchange messages; and OLE routing, which allows routing information to be embedded inside a message.

Unlike the earlier application programming interface wars between Microsoft and the rest of the messaging world, this extension seems to enjoy universal support from the industry.

"This is very significant because workflow never had a standard," said Bruce Silver, principal at Bruce Silver Associates in Weston, Mass. "We see small companies promising to solve big problems. [But] users don't want to place all their bets on one [workflow] company. This says you can use different products, but they'll interface with each other."

The specification "gives us the ability to interoperate between our workflow software and other messaging-type systems, such as [Microsoft] Exchange," said Lawrence DeBlasiis, chief information officer at Life Reassurance Corp. of America in Stamford, Conn. The firm is a heavy user of workflow applications. "We can send messages out quickly through a messaging system and get quick response back from the workflow system," he said.

The need to exchange workflow information is becoming more common, and user expectation is increasing in this area, said Vincent Grieco, a senior manager of applications integration at KPMG Peat Marwick in Short Hills, N.J.

And, for once, competitors aren't crying foul. Novell, Inc., which in the past has accused Microsoft of being less than candid about publishing its MAPI specs, supports the effort.

"It's complementary to what we've done," said Carl Hansen, product manager at Novell's Groupware Division.

Microsoft's and Wang's first imaging product debuts. See page 43.

Borland mixes Java/C++ brew

Developers gain database tools

By Frank Hayes

Borland International, Inc.'s popular C++ development system has been chased out of many large information systems departments in recent years. But the company last week unveiled a new version that beefs up C++ development and doubles as a Java development system.

That may give Borland's C++ new life among corporate developers, many of whom use Microsoft Corp.'s Visual C++ to make sure they aren't left behind amid changing versions of Windows.

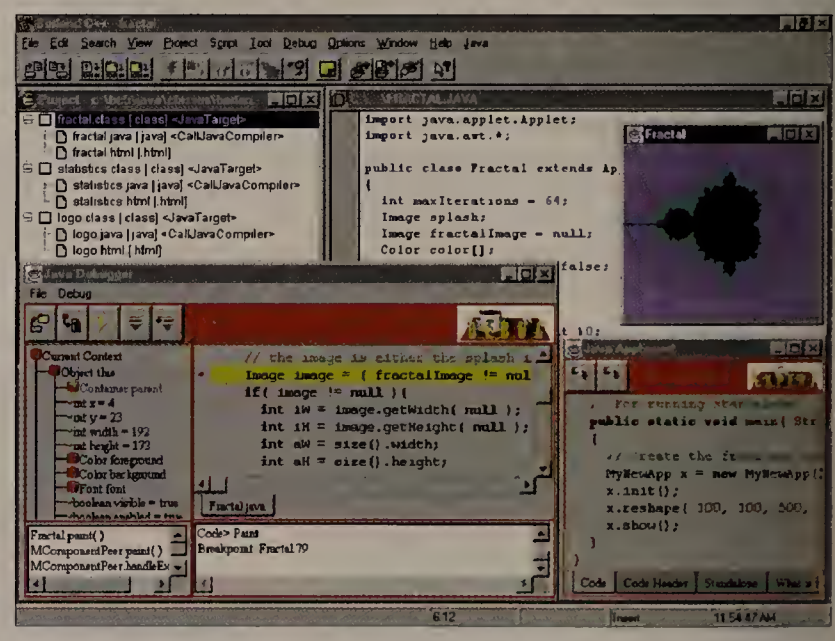
The 32-bit Borland C++ 5.0, which will ship next month, supports the Microsoft Foundation Class libraries to guarantee compatibility with Windows 3.1, Windows 95 and Windows NT. But it also includes Sun Microsystems, Inc.'s Java Development Kit for developing applications in Java, Sun's language for developing Internet-based applications.

Developers can even mix C++ and Java modules within a single project, according to officials at Borland in Scotts Valley, Calif.

Delphi double

The release also includes much-improved support for database access, which mimics the easy-to-use graphical data access system from Borland's Delphi visual development system.

"The key new feature to me is the set of database tools," said Brian D. Coryell, data processing manager at Parman, Tanner, Soule & Jackson, an accounting firm in Arkansas City, Kan. "I'm not interested in developing the next Lotus [spreadsheet] — I just want to get database work done."



The new 32-bit Borland C++ 5.0 *features Sun's Java Development Kit, its system for developing Internet-based apps*

Borland C++ 5.0 also includes a scripting system for completely configuring the integrated development environment. That makes it easier to focus on the C++ code, which is often criticized by corporate developers for being complex and hard to maintain.

"Borland's integration is very smooth," said Michael Day, a software engineer at Frye Electronics, Inc. in Tigard, Ore. "We're headed in the direction of tools that do a lot of the work for you, so you don't have to be a full C++ guru to figure out what you're doing."

For Java development, the system supports project management, access to Java compiler and debugger options, and color syntax highlighting for Java source code.

Borland also has added a graphical Java debugger and an AppExpert that walks developers through the process of building a Java application.

Borland C++ 5.0 costs $349.95. A larger development suite package, which costs $499.95, includes a bug-detection tool, version-control manager, installation-program generator and a just-in-time compiler for Java applications.

Tools that join C++ with Java. See page 46.

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to upgrade your operating system?

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is like finding the perfect time to mow the lawn.
However, finding the perfect reason is easy: value.
Upgrades have value insofar as they deliver dramatic improvements,
improvements that outweigh the cost of deployment.
With the Microsoft® Windows® 95 operating system,
that value is demonstrable. And in what follows, we'll show you how it,
and the 32-bit applications that run on it, can reduce your support burden,
increase your control over the desktop,
and improve the productivity of end users.
In short, we'll address the issues that tend to forestall serious evaluation.
We'll even go so far as to suggest that waiting has costs of its own.

Support for IS.

Support for system administrators begins with support for end users. With its simplified interface, Windows 95 allows users to work far more independently than in the past. Simply put, the greater their autonomy, the less time you spend answering obvious questions.

But it's not just the interface that's improved; the whole system is more reliable. Thanks to the 32-bit protect-mode components of Windows 95, users can run multiple applications at the same time, without running out of system resources or freezing-up their PCs. The same is true even if a network server goes down. And, with 32-bit applications now able to run in their own memory space, the likelihood of one app crashing another is almost nil.

Today, you can turn the desktop into the most tangible technology investment your company can make.

What's the upshot of all this? Well, it won't exactly turn you into the Maytag repairman, but it can cut helpdesk calls by 7 to 14% a year.[1]

Still, in designing a new OS, we realized that to make things easy for the end-user at the expense of the IS department would be self-defeating. And to that end, Windows 95 offers a variety of powerful tools to help you better manage your network and your time.

Built into Windows 95 are a number of tools to simplify administration. 32-bit versions of popular network clients, like Novell® NetWare® are included, as is support for standard transport protocols like TCP/IP and device standards. Plug and Play support detects hardware devices as they are added to the system, which makes installation a snap. And, with Server-based Setup and Batch Setup tools, it's now possible to install and configure Windows 95 on multiple desktops from a server. Automatically. Once you're wired, you can monitor performance and troubleshoot problems from a central location.

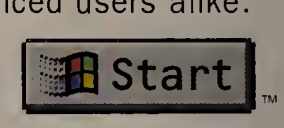
More support: more control.

System Policies in Windows 95 allow you to specify system settings and restrict network access and security privileges from a central location. So you can lock down desktop configurations whenever you see fit. And with User Profiles, individual users' desktop configurations are available wherever they log on to the network. This lets multiple users share one computer and "roving" users log on to other networked computers, while maintaining their own personal settings.

Again, with Windows 95, all of this can be done from a central location, reducing the number of on-site visits by 30 to 50%.[2] At last, you'll be able to focus on the big-picture stuff. So the next time someone asks you what's what with this Internet thing, you can say, *I have a plan.*

Productivity from the word *Start.*

The improved interface in Windows 95 makes nearly everything easier for novice and advanced users alike. Its Start button and task bar make applications more accessible. Long filenames make identifying files easier. Better tools such as Wizards and improved Help make learning features easy. Its right mouse button puts common commands a click away. And now that the separate Program Manager, File Manager, and Print Manager are gone, there are fewer concepts to learn. This makes for able, autonomous, and, dare we say, happy end users. People who require less training and support. Who, in short, can turn the desktop into the most tangible technology investment your company can make.



But Windows 95 isn't just easier, it's more responsive. Basic operations, like printing or accessing a file on a PC or over a network, are faster. And with its 32-bit multitasking capability, users can conduct file searches, online communications, or other tasks all while, say, editing a document. In fact, studies show that once users are familiar with the new OS, they're able to accomplish many tasks in about half the time it took under Windows 3.1.[3]

Of course, no one spends their entire day tooling around in their operating system. People have work to do. With that

1. WorkGroup Technologies, Inc., a market research firm, collected and analyzed the helpdesk logs of 10 Fortune 100 companies in order to project the impact of Windows 95 on call avoidance, problem resolution, and on-site call reduction. The logs represented 100,000 PC users and 1.5 million helpdesk calls per year. **2.** WorkGroup Technologies, Inc. **3.** To quantify the learning curve from Windows 3.1 to Windows 95, and evaluate user productivity on Windows 95, Usability Sciences Corporation, an independent usability testing organization, had 75 beginner, intermediate, and advanced Windows 3.1 users complete tasks with both operating systems. They found that users were 91% more productive with Windows 95, and 94% more accurate. Tasks performed included: finding and opening files and programs, copying and moving files, and switching between active programs. **4.** The MASIE Center, a recognized software training center and think-tank found that only one hour of briefing and two

The prevailing wisdom and why, this time, you should ignore it.

Common sense tells you to hold off on making the move to Windows 95, to wait until someone else finds the bugs. Well, someone else already has. With the largest beta program in history, Windows 95 was installed on more than a million desktops worldwide. Now, just six months into its commercial release, thousands of organizations are in pilot and rollout. And to keep them current, we've put together an online Service Pack with the latest drivers and other new components. In short, the dreaded "1.0 version" has already come and gone.

in mind, no evaluation of Windows 95 would be complete without simultaneously evaluating some of the 32-bit applications designed for it, such as Microsoft Office for Windows 95.

Now users can focus on their work instead of their software.

Office 95 is more than just fresh features on top of Office 4.x. It's a deeply integrated suite of applications. Integrated, both with the operating system and with each other. Because users can leverage their knowledge of one application throughout the entire suite, they need only three hours of training to be effective in all of them.[4] Needless to say, this can dramatically reduce training costs.

But what about support? While it's one thing to get PC users up and running, it's quite another to teach them all the skills they'll ever need. And of course, you can't; users simply aren't interested. (Remember? They've got work to do.) Knowing this has made all the difference in designing Office 95. It's resulted in advances such as the Answer Wizard, which lets users ask the computer plain English questions like, *How do I print sideways?*, and then shows them exactly how to do it. As a result, you can expect a 48% reduction in Office-related help calls.[5]

With Office 95, users are not only able to work on their own, they're able to accomplish more things faster. Labor-saving features such as updated AutoFormat and Spell-It in Word, and enhanced AutoComplete in Microsoft Excel, not only render everyday tasks automatically, they do so accurately. According to Kelly Services, the folks who train and supply corporations with over 325,000 temps each year, users complete their tasks 37% faster with Office 95. And they're 36% more accurate in doing so.[6] Not a bad day at the office.

Why sooner is better than later.

If, as the headline says, there's never a good time to migrate, why make the move now? Why? Because deployment takes time. Product reviews, network configurations, lab tests, pilot programs, rollout — it takes time. And if the goal is to decide *Is it worth it?* and you continue to put off serious evaluation, it'll be that much longer before you begin to realize the productivity gains and cost savings that Windows 95 and Office 95 have to offer.

But let's assume you upgraded today. How long would it take to recoup your migration costs? According to a leading consulting firm, Office 95 will pay for itself in 10 months in medium-sized companies, and 12 months in large organizations.[7] Factor in the increase in end user productivity, and those numbers fall by nearly half.

No question about it, the move to 32-bits is a big one. But as part of the larger evolution in chip architecture, hardware platforms, and application support, it's not one that you or Microsoft is making alone. Won't you join us?

How to start.

To receive a free copy of Trial 95 — including guides for evaluation and deployment, resource kits, feature reviews, and, of course, copies of both Windows 95 and Office for Windows 95, each with a 90 day license — call (800) 583-0042, Dept. A017. Or visit our Web site at www.microsoft.com. All the backup for the studies cited here is included, along with an ROI modeling tool so you can plug in your own numbers.

Windows 95 or Windows NT Workstation? Yes.

Both products are strategic for your organization. Together they make it possible for you to deploy Win32®-based applications, reduce your support costs, and make your end-users more productive — across all your desktops. The right mix for your organization will depend on your business needs and constraints. For guidelines on how to pick the right mix, go to www.microsoft.com/windows/mix.

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hours of self-discovery were required to migrate Office 4.3 users to Office 95. **5.** WorkGroup Technologies, Inc. **6.** Kelly Services, Inc. conducted a controlled usability study of 35 employees who regularly use Office 4.3. Participants were measured for speed and accuracy in completing commonly performed tasks. **7.** International Data Corporation modeled the expected returns on investment of Office 95 for large companies (1,000+ PCs) and for small-to-medium companies (100 PCs). On a cost-to-use basis, large companies will see their investment paid for in 12 months, small companies in 10. On a value-to-use basis, those figures drop substantially: 4.8 months for large companies, 5.3 months for small. © 1996 Microsoft Corporation. All rights reserved. Microsoft, Windows and Win32 are registered trademarks and Windows NT, the Windows Start logo, and *Where do you want to go today?* are trademarks of Microsoft. Novell and NetWare are registered trademarks of Novell, Inc.

Remote sites gain low-cost network options

By Bob Wallace

Much like prospective NFL linemen, internetworking vendors are bulking up their product lines to contend for a chunk of the money information systems managers have set aside to support remote sites.

Last week's entries in the remote networking feeding frenzy were Xyplex, Inc. in Littleton, Mass., which is focusing on remote site gear, and Motorola, Inc.'s Transmission Systems Division in Schaumburg, Ill., which is zeroing in on products for central sites.

And on the switching front, Alantec, Inc. in San Jose, Calif., as expected, has announced Fast Ethernet wares for users who need more switching muscle.

These companies join market leaders such as Ascend Communications, Inc., Cisco Systems, Inc., Bay Networks, Inc. and 3Com Corp. The products offer lower-cost options to existing products.

Xyplex's RouterRunner is a multiprotocol bridge/router that comes in two configurations: an Integrated Services Digital Network (ISDN) model with one port for LANs and one port for ISDN, which costs $1,399; and a model that features three ports for LAN, synchronous and asynchronous connections, which costs $1,499.

Both models route IP and Novell, Inc. IPX protocols and support multilink Point-to-Point Protocol (PPP). This lets users combine a Basic Rate Interface's (BRI) two 64K bit/sec. lines for more bandwidth-hungry applications and better performance.

Motorola has announced a series of enhancements to its 925 Remote Access System, which is a central site remote access hub. Chief among the improvements is Bitsurfr Central, a shelf-mount ISDN BRI terminal adapter. Bitsurfr Central costs $775 and will ship next month.

"The major difference between the Xyplex RouterRunner and the 925 is that the Motorola box can't support multilink [PPP], which is an essential capability for users [who] want to use ISDN BRI as the remote worker's [wide-area networking] option of choice," said Maribel Howard, an analyst at International Data Corp. (IDC) in Framingham, Mass.

"Users want much more bandwidth than high-speed modems provide," she said.

Users can get 128K bit/sec. of bandwidth by using multilink PPP with an ISDN BRI line.

Meanwhile, Alantec last week announced Fast Ethernet modules for its high-end PowerHub 6000 and 7000 chassis-based switching hubs.

The 6X1 Universal Fast Ethernet Module occupies one PowerHub 7000 slot and supports six 100M bit/sec. segments. Each port can be run in full-duplex mode for 200M bit/sec. of bandwidth and will support twisted-pair wire or fiber links. It costs $5,950 and is shipping now.

Alantec has also rolled out three Fast Ethernet microsegment modules: one for the PowerHub 7000 and two for the smaller PowerHub 6000. These modules let IS managers reduce bottlenecks at the desktop level and improve links between desktops and the backbone network. The modules provide shared Fast Ethernet capacity.

The 2X8 Fast Ethernet microsegment module supports two Fast Ethernet segments, each with up to eight devices. It costs $7,950 and will ship in the second quarter. The 1X12 and 2X12 modules are for the PowerHub 6000. The 2X12 and 1X12 haven't been priced yet and will ship in the second quarter.

Fast track

The remote access market will swell to $1 billion in 1998, according to a recent study by IDC.

UB Networks improves its virtual LAN. See page 53.

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INSTRUCTORS:
Geoffrey Moore is the author of *Crossing the Chasm: Marketing and Selling Technology Products to Mainstream Customers* (HarperCollins, 1991) and *Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge* (HarperCollins, 1995). He is the president of The Chasm Group. Mark Cavender, principal with The Chasm Group, has over 17 years of marketing and sales management experience in the computer industry.

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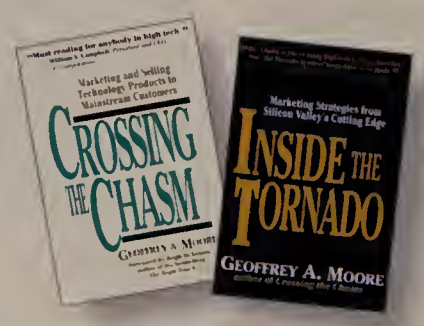

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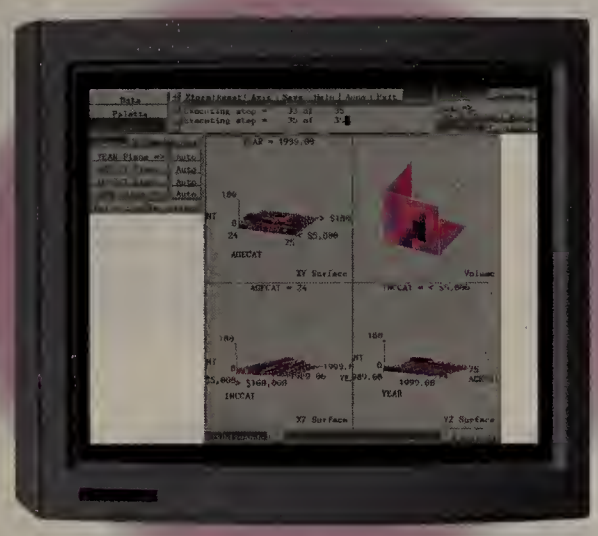

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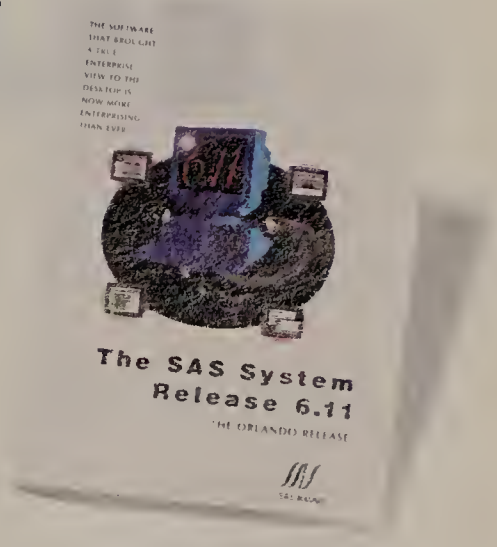

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LapLink opens up remote access

By Mindy Blodgett

Everyone wants faster, easier mobile connections across any and all links — which is precisely what Traveling Software, Inc. says it will provide in the updated version of its LapLink remote access software.

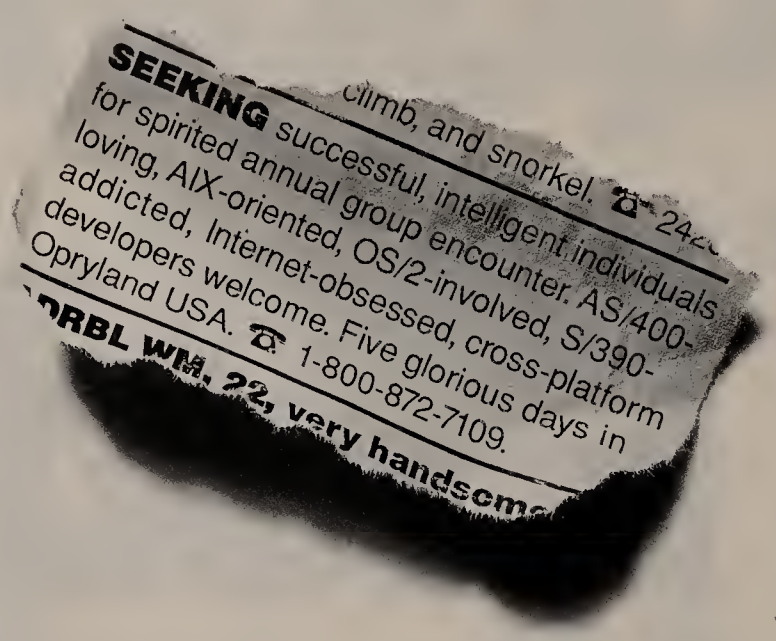
LapLink for Windows 95 features support for up to 11 multiple connections, so an information systems manager can connect to several machines at once and transfer files if desired.

LapLink for Windows 95 is loaded on all devices in use, including desktops and laptops, and the systems administrator can access any machine any time — or all at once — to transfer files or messages.

Also provided are simultaneous connections, via various modes, of several different machines. For instance, a PC user who is connected to the network by cable and a laptop user who is connected by infrared would be able to transfer files between the two devices. The use of peer-to-peer architecture rather than guest/host architecture lets users with technical problems receive technical support on the line on which they are connected.

The new version costs $149 or $49.95 for an upgrade. It comes in a 16-bit version or 32-bit version, which gives users a smooth transition from Windows 3.1 to Windows 95, representatives at the Bothell, Wash.-based company said.

Industry analysts said providing access to both versions of the operating system is a smart marketing ploy because many businesses use both systems.



Key features of LapLink for Windows 95

- Allows up to 11 multiple connections across any transport
- Offers simultaneous connections
- Provides 16-bit and 32-bit versions in same box
- Has bidirectional, or peer-to-peer, architecture

"Companies have many different phases and plans for [moving] to Windows 95," said Elisabeth Rainge, an analyst at International Data Corp. in Framingham, Mass. "It's smart not to assume that everyone is rushing to Windows 95."

Company officials said LapLink for Windows 95 also has eliminated the need to set up modem connections and other dialing information by providing support for Windows 95 Telephony Application Programming Interface (TAPI) from Microsoft Corp. This feature can save users time and eliminate slow connection setup times.

TAPI lets a user log in telephone numbers and locations on a laptop and dial in without re-entering the number each time. TAPI also allows two or more applications to share a modem.

Ross Pfaff, vice president of Empire Driving Training, Inc. in Buffalo, N.Y., said he uses LapLink for Windows 95 to communicate between his home and office computers. "The reliability is really there with this product," Pfaff said. "I've tested a lot of other remote access software that [is] supposedly compatible with Windows 95 and have had problems with crashing when I'm transferring large files. So far, that hasn't happened with LapLink."

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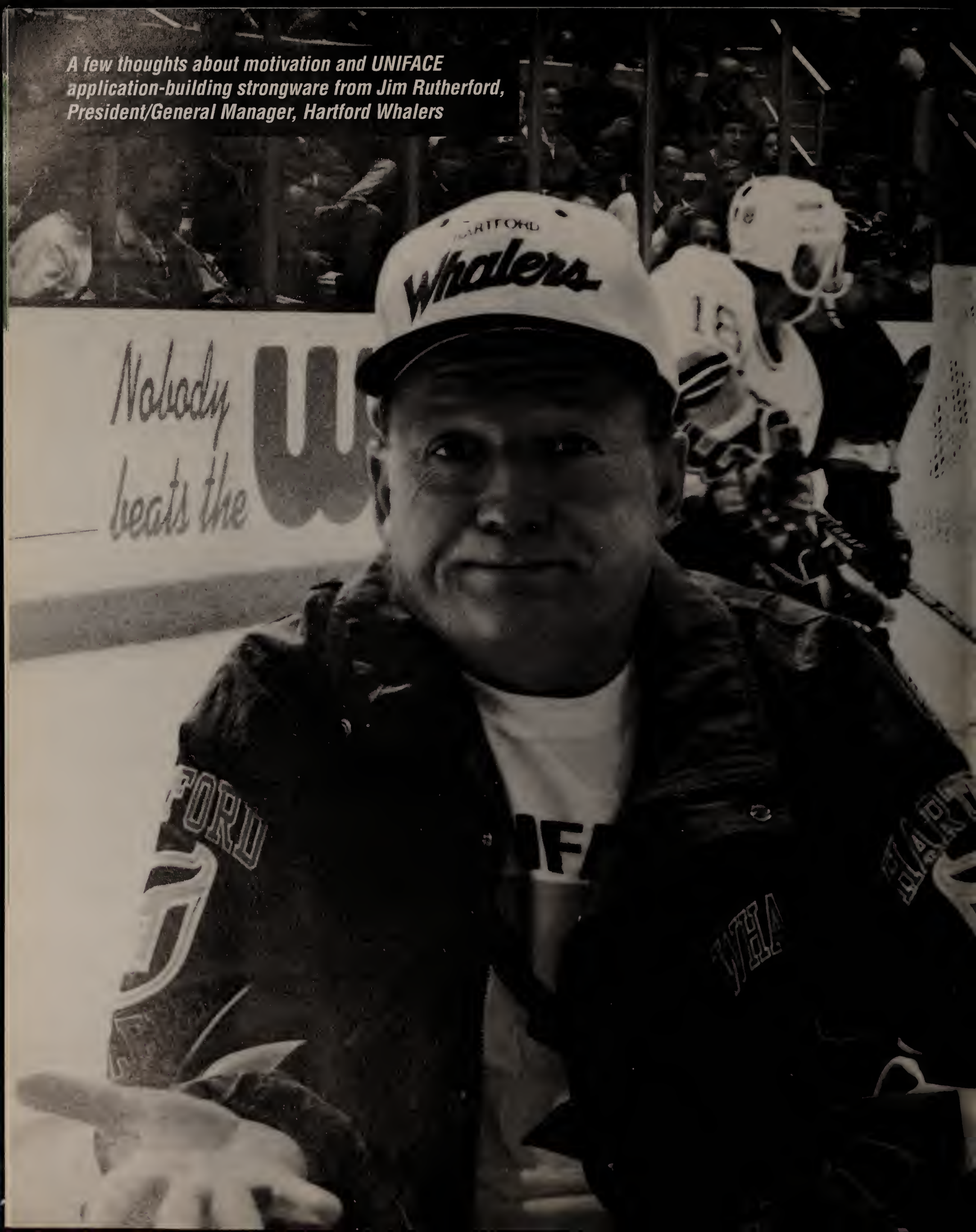
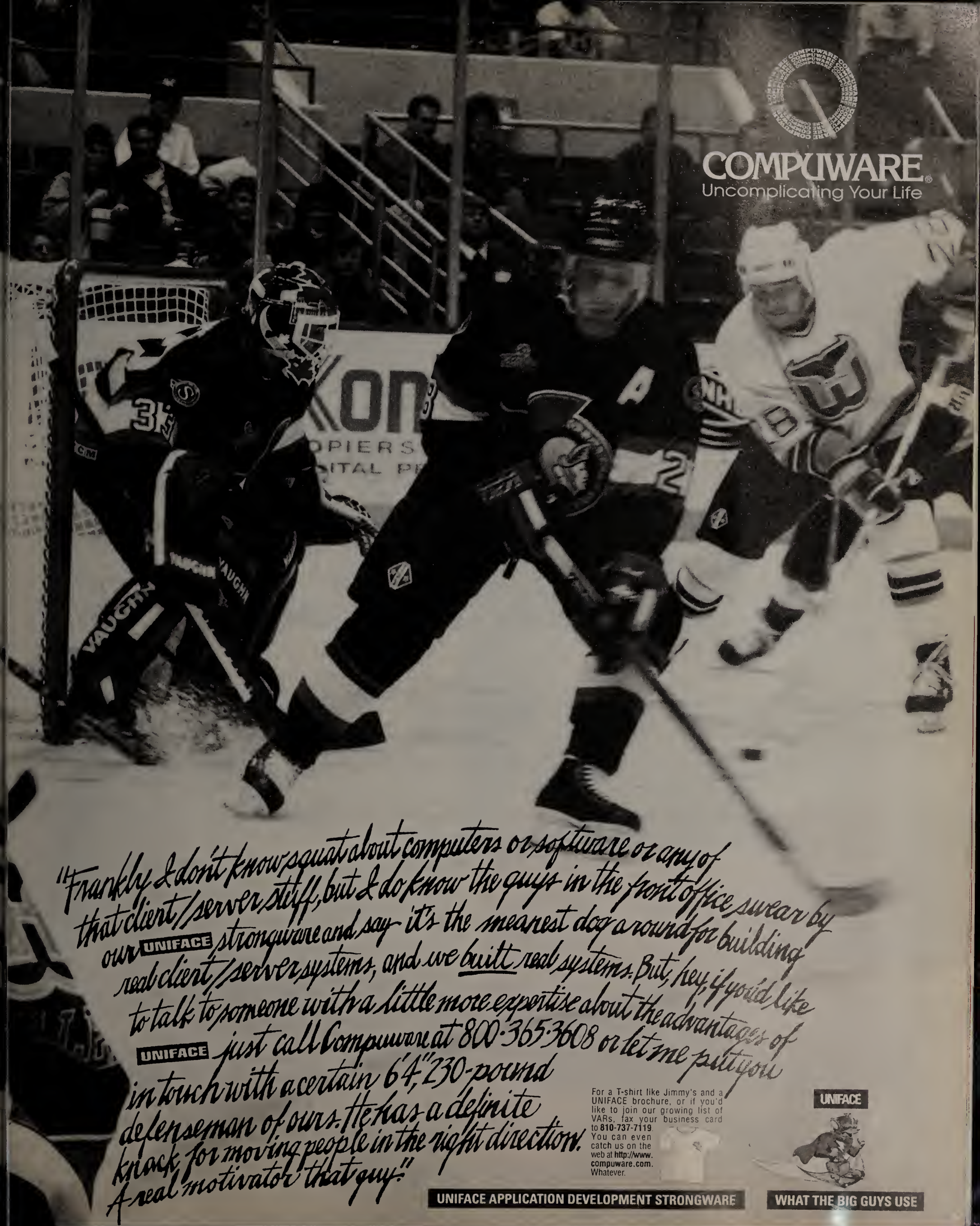
A few thoughts about motivation and UNIFACE application-building strongware from Jim Rutherford, President/General Manager, Hartford Whalers

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WHAT THE BIG GUYS USE

Net noise pollution

Correlation software helps sift, prioritize the flood of network alarms

By Patrick Dryden

Faced with a relentless rise in network alarms, the network operators at health care giant Kaiser Permanente Health Plan, Inc. found a sensible way to cope with the status alerts flashing across their screens.

They stopped responding to them all.

The Kaiser command center at the Walnut Creek, Calif., headquarters had been polling every component throughout the 60-site wide-area network. That meant that if, for example, a single router failed to respond, central staff would be flooded with alarms for hundreds of downstream devices — all the hubs, servers and stations beyond that point.

"They had to scan through all the alarms, so it was a hit-or-miss situation to pick the right event to examine," said Mike Okulski, a network management consultant in Castle Rock, Colo.

Okulski helped cut through the network management noise by installing event-correlation software, which can make sense of the hundreds and even thousands of alerts that can bombard central managers' consoles daily.

"Correlation software speeds problem resolution because managers can respond to real problems instead of chasing ghosts," Okulski said.

Today, many management vendors are tuning the event-correlation engines in their products to help such beleaguered administrators (see story at right).

Administrators have to cope with an enormous amount of management data and discern patterns among diverse components so they can start automating their responses, said Waverly Deutsch, an analyst at Forrester Research, Inc. in Cambridge, Mass.

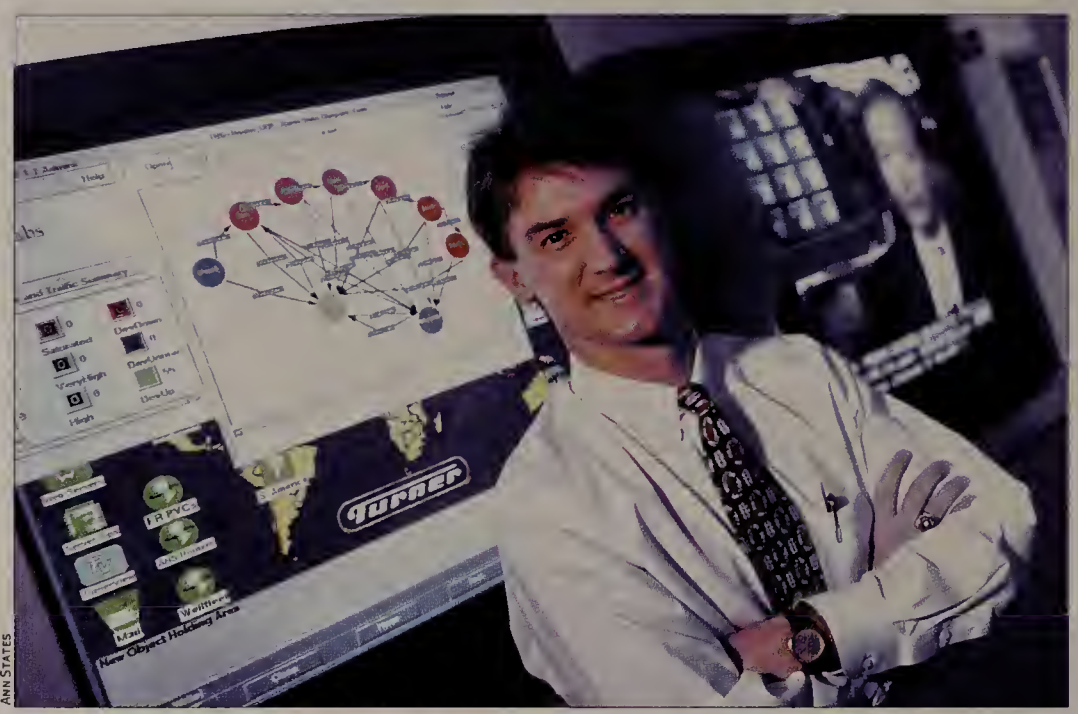
Kaiser Permanente copes by decentralizing network management and deploying NerveCenter from Cupertinto, Calif.-based Seagate Enterprise Management Software, Inc. at 30 of the largest sites for local alarm analysis.

Central network staff members see only about one-fifth of the alarms from those sites because NerveCenter filters out bogus events and forwards only the critical alarms, Okulski said.

Turner Broadcasting System, Inc. also relies on NerveCenter to eliminate duplicate and erroneous alerts from its global network.

"We need it to head off events at the pass," said Scott Parker, supervisor of Unix and networking support at Turner Broadcasting in Atlanta. "If the link into Hong Kong goes down and we can't ping everything there, we don't want to receive every downstream alarm."

Now that servers on the World Wide Web are a vital part of Turner Broadcasting's operations, Parker's staff has written shell scripts to help NerveCenter check them. But he also would like to have more direct interaction with those Unix systems.



ANN STATES

Turner Broadcasting's *Scott Parker says he uses NerveCenter to kill unneeessary alerts. 'If the link into Hong Kong goes down... we don't want to receive every downstream alarm.'*

Tracing the roots

Operators at British Columbia Systems Corp., a communications provider in Victoria, B.C., faced as many as 10,000 alarms per day while monitoring the network. That deluge shrank to a trickle when the company tested Netcool/Omnibus event-management software from Micromuse USA, Inc. in Dallas.

"Now our operators can see what's broken instead of every device that depends on that failed element," said Keith Finnie, manager of network management systems. Netcool/Omnibus reduces and interprets the stream of alarms that can erupt from 1,500 routers, 150 hubs and 650 X.25 network devices.

Event correlation also helps operators at the Canadian company associate resources on the routed TCP/IP network that deliver encapsulated SNA traffic. "We can effectively set alarms for SNA faults that were blind to us before," Finnie explained.

PinPointing the problem

Network administrators soon may be able to quickly document the configuration of stations and servers by gathering data from the LAN tool kit that manages them.

PinPoint Software Corp. in San Jose, Calif., recently introduced Version 2.3 of ClickNet Professional. This network diagramming and reporting software now can connect to popular LAN management suites.

"Extracting the latest information from these LAN tools would save us a lot of grief when we update the design of 6-year-old networks put in by mom-and-pop integrators," said ClickNet user John Devertis, a senior network consultant in the multivendor network services group at Xerox Corp. in Rochester, N.Y.

New modules integrate ClickNet with Saber LAN Workstation from McAfee Associates, Inc. and LAN Directory for Windows from Seagate Enterprise Management Software.

The goal is to provide a common data repository beneath a graphical mapping interface that unifies the tools that are used to manage LANs, said Norm Klapper, president of PinPoint.

Upcoming modules will add support for tools from Intel Corp., Microsoft Corp., Symantec Corp. and others, Klapper said.

ClickNet modules mine valuable data from each vendor's tools and present it consistently in one management database, Klapper said. "We find pretty messed up data architectures underneath these tools, which have been built into suites through acquisition," he said.

— Patrick Dryden

Alarming overload

By Patrick Dryden

A host of network vendors are attacking the problem of network alarm overload with products currently on the market and some on the way. They include the following:

- **Seagate Enterprise Management Software, Inc.** in Cupertino, Calif., has introduced a major revision to its event-correlation software for Hewlett-Packard Co.'s OpenView management platform. NerveCenter Pro will add the ability to analyze the behavior of Unix, NetWare and Windows NT servers as well as network devices. It will be released in March.
- **Cabletron Systems, Inc.** late next month expects to release Version 4.0 of Spectrum, a distributed management platform that already correlates conditions for devices modeled in its knowledge base.

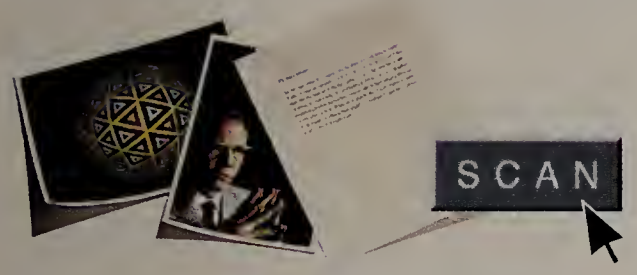
A new case-based reasoning tool called SpectroRx for Spectrum Resolution Expert will take over correlation functions, officials at the Rochester, N.H., firm said. It will track problem situations, compare each event to find the closest match and list recommended actions that worked previously. Or it will handle those fixes automatically.

- **System Management Arts, Inc.**, a start-up in White Plains, N.Y., claims its newly patented event-correlation technology will better model the complex relationships between diverse network and systems elements.
- **Objective System Integrators** (OSI) in Folsom, Calif., and **Isicad, Inc.** in Santa Clara, Calif., teamed up recently to integrate their tools.

OSI's NetExpert, an operations support system that provides real-time, rules-based alarm correlation, now links to Isicad's Command software for tracking physical connections and asset data.

- **Boole & Babbage, Inc.** in San Jose, Calif., recently enhanced Ensign, its event manager and systems administration software. A new distributed console supports Windows NT and correlates network and systems alerts with predefined automation modules.
- **Maxm Systems Corp.** in McLean, Va., recently enhanced Max/Enterprise automated event and alarm management software to integrate with leading network management platforms and legacy systems.
- **IBM** late last summer added event-correlation capabilities to the NetView for AIX network management platform.

The pen may be mightier than the sword, but the Scanner blows them both away.



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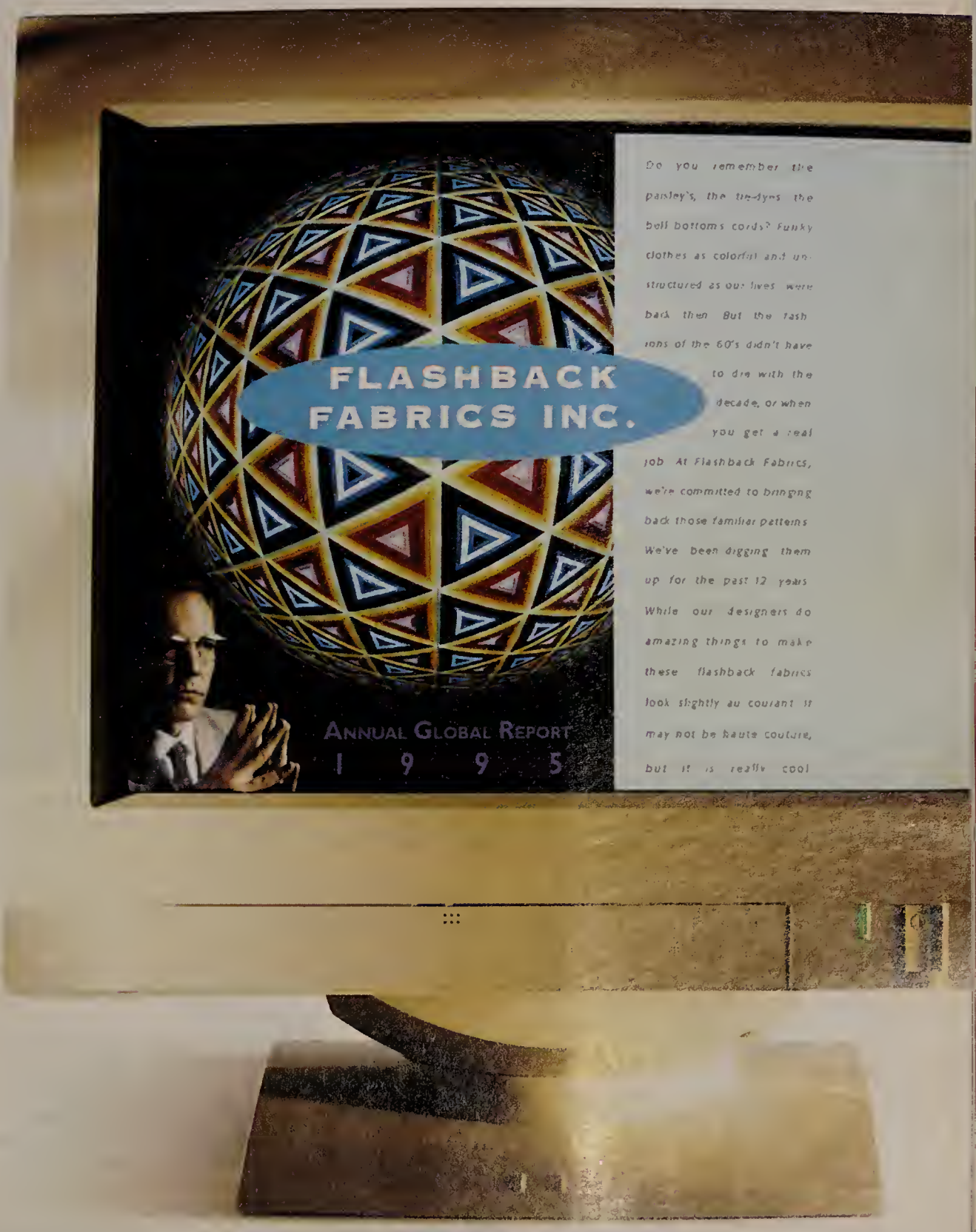

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In-house test suites may be the way to go

By Julia King

Do-it-yourselfers, take heart. You can conduct your own benchmarks and live to tell the tale.

For example, members of the information systems staff at Bankers Trust Corp. in New York took on the task of writing their own benchmark tests rather than rely on standardized ones.

They created software that emulates the company's computing environment, mimicking factors such as transaction volumes, delays and user loads. This simulation package is now used to test new technology under consideration.

But the process is neither quick nor cheap.

Writing a new in-house benchmark takes "a solid man-month," said Alan Friedman, the bank's vice president of technology. But the work is necessary "because what vendors do in their labs is not usually what I do in my shop."

If you find it appealing to benchmark a piece of hardware, a relational database management system or a client/server application, several vendors sell products designed for in-house benchmarking. A sampling includes the following:

- LoadRunner from Mercury Interactive Corp. in Santa Clara, Calif., (408) 987-0100, tests internally developed client/server or Web applications.
- PreVue, PreVue-C/S and PreVue-X from Performance Awareness Corp. in Raleigh, N.C., (919) 870-8800, stress-tests off-the-shelf or internally developed apps.
- Pure Performix from Pure Software, Inc. in Sunnyvale, Calif., (408) 720-1600, load-tests multiuser applications.

Prices range from $200 for simple Windows quality-assurance software to $25,000 for Unix client/server application test suites.

ALAN LEVENSON

Ruth Brower and Mike Benson of Nestle USA found a sweet alternative to benchmarks: word of mouth and on-site demos

Nestle's advice: Skip the benchmarks and ask your colleagues

Not up to interpreting standardized benchmarks? You're not alone.

Some users rely solely on word of mouth. At Nestle USA in Glendale, Calif., IS managers looked at neither hardware nor software benchmarks when they were buying components for a new client/server human resources system.

"In such a diversified client/server environment, benchmarks simply lose their usefulness," said Mike Benson, director of human resources information systems. "When you introduce a client/server application, you introduce ... many more variables that make benchmarking very difficult."

So Nestle relied on information it solicited from IS managers at similar-size companies. It also had software vendors come on-site and demonstrate their systems to end users.

When completed next year, the new human resources system — comprised of Hewlett-Packard Co. Unix machines and Intel Corp.-based file servers that run Windows NT and PeopleSoft, Inc. applications — will handle the payroll and personnel records of 23,000 Nestle employees nationwide.

— Julia King

Balancing benchmark pros and cons

CONTINUED FROM PAGE 1

tion Corp. (SPEC) in Manassas, Va., which compiles SPEC benchmarks on a range of workstations.

Henry Gertzman, a project leader at MCI Communications Corp. in Washington, said, "[TPC benchmarks] saved our hides" when the firm was trying to develop a large decision-support system two years ago. "We never could have done as robust and thorough a job [of prepurchase testing] as this professionally written benchmark," he said.

But benchmarks from consortia also have their flaws. For example, several users have criticized the TPC benchmarks for the following reasons:

- The rules are loosely defined for implementing tests, which makes it impossible to compare different vendors' results.
- Vendors can intensively "tune" their benchmarks, so end users can rarely achieve the same results without a full-time staff of highly trained technicians.
- There are no apples-to-apples benchmarks for any single relational database system on multiple vendors' machines, for example.

A grain of salt

Given these conditions, "users absolutely should not trust what the TPC is doing wholeheartedly and with closed eyes," advised Roland Thompson, one of two user representatives to the TPC.

IS managers often must balance conflicting feelings toward standarized benchmarks. While they like the precise, scientific measurements the figures promise, they dislike and distrust the marketing hype, the complexity and the occasional whiff of scandal associated with them. Many IS managers just end up confused.

"It really is hard to know just what to make of many benchmarks, at least for us," said John Denatale, manager of client services at Elkay Manufacturing, Inc., an Oak Brook, Ill., manufacturer of sinks and drinking fountains.

For all vendors, benchmarking is first and foremost a marketing tool, not a true measurement.

Database vendors, in particular, will spend up to $100,000 and three months to run a single TPC benchmark. They spare no effort to get the highest possible numbers to throw around in advertising campaigns and sales calls, noted the TPC's Thompson.

First-hand knowledge

Users who buy packaged client/server applications, on the other hand, prefer first-hand anecdotal information about a package's functionality and ease of use from other users (see story above right).

"In evaluating an application, we're not concerned initially about speed and throughput but about the application meeting the needs of users," said Don Thaler, IS manager at LNR Communications, Inc., a manufacturer of satellite communications equipment in Hauppauge, N.Y.

But there are ways users can brush aside some of the vendor hype and obtain real benefits from benchmarks.

Users can compensate for vendor system tuning by expecting to get about 75% of the performance they advertise, said Andrew Allison, an industry consultant in Carmel, Calif. For example, a system whose benchmark claims a 2-second response time really will deliver a response time of 2.5 seconds.

Since all the vendors have identical incentives and similar resources to maximize their results, users can presume all the results are hyped to the same extent, Allison added.

Yet another alternative open to larger customers is to talk vendors into running benchmarks for them.

For example, when mutual fund broker Fidelity Investments in Boston was creating a decision-support system two years ago, "We picked the most typical queries we dealt with and submitted them to different vendors of hardware and software," said Victor Sokolovsky, principal software engineer.

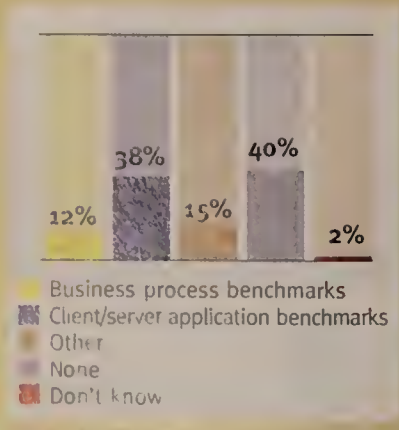
"This took a year and a half," he said, "but we felt we had to go through it, or we couldn't make an intelligent decision."

Banned in Britain

Oracle Corp.'s benchmark-based advertising over the past few years has been so hyperbolic that a British government agency concerned with truth in advertising has twice forced it to withdraw ads from British publications.

Users run benchmarks on more than just databases . . .

What benchmarks other than database benchmarks does your company evaluate, if any?



Base: 100 IS managers using relational database or client/server application. Multiple responses allowed.

. . . and they find the results a useful performance measure

Do you consider those benchmarks to be reliable measures of performance?

Base: 60 IS managers running benchmarks on technology other than databases

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Over the past decade, demand for UNIX systems and software has skyrocketed. Every major computer maker has UNIX as a strategic platform, and more business software runs on UNIX than any other operating system. UNIX has clearly proven its power and reliability, particularly when it comes to business-critical computing.

Last September, Hewlett-Packard, Novell and the Santa Cruz Operation formed a joint business relationship to deliver a high-volume UNIX operating system. This agreement, which will lead to a "merged" product release that delivers the best from the SCO OpenServer and UnixWare environments, at last unified a large part of the UNIX marketplace.

This merged product, code-named Gemini, will enable customers and developers to depend on a single UNIX with an easy migration path to 64-bit network computing. The agreement will also allow application developers and corporate IT teams to develop to one Intel networked UNIX platform.

This supplement is divided into two parts. The first, written by IDC analyst Dan Kusnetzky, examines the current competitive landscape for the UNIX environment. The second part, written by SCO's Scott McGregor, details the company's product strategy and explores where the "Road to Gemini" will lead.

"High-Volume Server Environments" was written by Daniel Kusnetzky, Research Director for the Unix and Server Operating Environments Program at International Data Corp. (IDC), Framingham, MA. He is responsible for analysis on transaction processing, database, networking and client/server technology on advanced operating environments. He examines emerging technologies, vendor strategies, R&D issues, channels of integration and end-user integration requirements for IDC, the IT industry's leading provider of market research and consulting services.

High-volume server operating environments

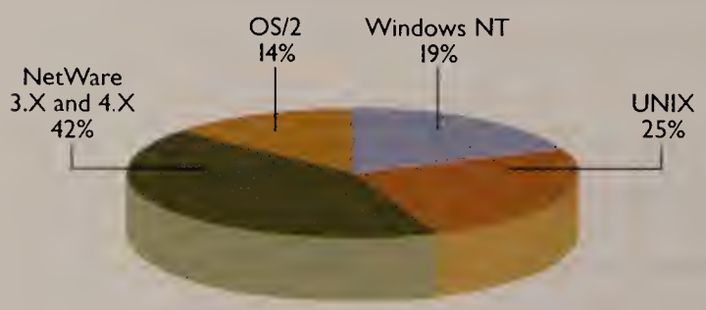
By Daniel Kusnetzky, International Data Corp.

Today's distributed, or client/server, application architectures are usually supported on one or more client operating environments (i.e., Windows, Macintosh, OS/2, Windows NT Workstation or UNIX) and one or more server operating environments (i.e., UNIX, NetWare, Windows NT Server or OS/2).

Today, most of these applications are implemented using a two-tier architecture, in which the client cooperates with a server. In time, most application developers will adopt three-tier (or more) configurations, in which clients cooperate with a workgroup server, which collaborates with an enterprise server. After that, a client might cooperate with one server for Internet access, one server for database support, one for messaging, and one for management and security functions.

Figure 1

Worldwide Server Operating Environment Host/Server License Shipments, 1995



Source: IDC

Server operating environments (SOEs) are operating systems that provide file, print, communication, database, application, management and other services to PC clients. Multitasking and multiuser, these environments support hardware platforms (32-bit or greater) from multiple vendors. OS/400, MVS and OpenVMS are also capable of multitasking and multiuser functions, but IDC does not see them competing with SOEs because they are single-vendor operating environments.

SOEs support network services in several ways. Workstations and small- to large-scale systems can all be used as platforms for these services in a networked environment. This means there is no direct relationship between the size of a system and its ability to be utilized as a network server. Some organizations implement mainframe-class applications on a configuration that consists of many small-scale systems or UNIX PCs.

Major server operating environments

The major SOEs are IBM OS/2, Novell NetWare, Microsoft Windows NT Server and the UNIX derivatives. OS/2, Windows NT and UNIX also have desktop client versions.

SOE host/server license shipments grew from 1.44 million in 1994 to 1.94 million in 1995, a jump of 38.4%. NetWare has the most license shipments (Fig. 1), but a more vital statistic is the number of users/clients supported in a given environment. A typical OS/2 server supports 8 to 12 clients; a NetWare server, 20 to 25 clients; a system running Windows NT Server, 25 to 30 clients; and a typical UNIX server, 50 to 60 clients. Not only can UNIX support more users/clients than other SOEs, it also supports a broader range of hardware configurations. Fig. 2 shows the license shipments of the major UNIX derivatives.

The two most common approaches to providing network services are host-based environments and server-based environments. In both cases, the operating environment is multiuser and multitasking. Hardware platforms supported by these operating systems can be uniprocessors, symmetric multiprocessing (SMP) systems, clustered systems or

massively parallel processing (MPP) systems.

Only UNIX supports all these hardware platforms. Windows NT Server, OS/2 and NetWare 4.x support uniprocessors and SMP systems. The capability for OS/2 and NetWare to support SMP systems just became available in late 1995. Microsoft is working with Digital Equipment Corp. to add clustered systems to the Windows NT Server list, but this capability will not be available until 1997.

In a network, host- and server-based environments provide file/print, application, database and communications services.

File/print services: The server shares access to large storage devices, CD-ROMs and many types of printers. To utilize these services, clients need only sufficient storage to boot up a client operating system that can request file/print services from the server. This is the most common network service.

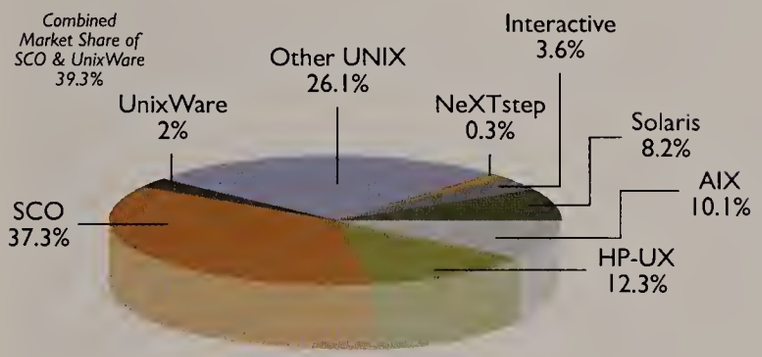
NetWare can provide other services through add-on NLMs, but NetWare servers usually provide only this service to networked environments. Other SOEs are typically used for other network services.

Application services: The server provides a complete application, such as electronic messaging, to clients. Clients utilizing these services need only to provide a user interface for these applications. If the server is running UNIX, a user can access this network service via a character cell terminal or a client system emulating one. The application is centralized, which minimizes the cost of administering it in the networked environment.

Database services: The server provides intelligent data storage and retrieval functions for the networked environment. The operating system does not usually provide this service directly. Database engine/server software is provided by vendors such as Oracle, Sybase, Informix, Computer Associates, Microsoft, etc.

Figure 2

Worldwide UNIX Host/Server License Shipments, 1995



Source: IDC

Communications services: The server provides functions to the networked environment such as local or remote host access, WAN access and Internet access.

Server functions are often implemented either as a standalone operating environment or as an additional service layered upon a general-purpose operating system such as UNIX. Most standalone servers provide top performance when the only requirements are file and print services; when it comes to supporting other functions, they are less stable and robust. If multifunction servers are required, layering file/print functions on a general-purpose operating system is the best choice.

NetWare is usually seen as a single function server. Although V4.x has improved the stability of NetWare when multiple NLMs are installed — by allowing these modules to be run as user-level processes — IT managers still are likely to configure a NetWare server to support only a single network service.

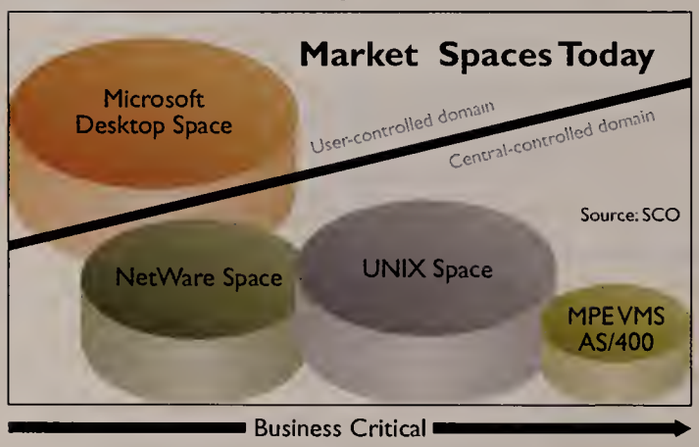
On the other hand, UNIX, OS/2 and

Windows NT Server typically support multiple network functions. OS/2 often supports Lotus Notes and file/print services. UNIX and Windows NT Server often support application, database, communications and file/print services on one system. UNIX is the most common multi-function SOE.

Most SOEs reside in the second or third tier of a distributed architecture and can support commercial or technical applications. Commercial applications typically impose a greater I/O, database and network burden on a system. Technical applications impose a greater memory and processing burden.

Although multi-function SOEs can support both types of processing simultaneously, most organizations put processor-intensive applications on a different system than those supporting file/print or database services, in order to maximize the server performance seen by client systems.

Figure 3



The battle between UNIX and the other SOEs will be a long one. UNIX's head start in both market share and functional capability will keep it reasonably safe from other SOEs for several years. If UNIX vendors can stop viewing each other as "the competition" and start looking at Windows NT as their opposition, they will be able to work together better. The more common the API environment for developers, the more the different UNIX flavors will be able to leverage one another's success. Recent moves in the UNIX market suggest a strong possibility this will happen.

The market for RDBMS software and the associated connectivity software, gateways and development tools for SOEs is booming, and UNIX has secured its position of top SOE for RDBMS software by increasing its share 0.6% to 87.1%. NetWare maintains its #2 spot with a 4.7% share. Windows NT shows the strongest growth, increasing 1.3% to achieve a 4.2% market share. OS/2 continues to slide as a platform for RDBM software, its market share having declined 0.6% to 3.9%.

The future of UNIX

Windows NT notwithstanding, the UNIX marketplace will continue to be a hot growth area for the next few years. Fortune 1000 class customers continue to replace proprietary minicomputers with UNIX systems in timesharing- and client/server-based solutions. As a whole, the UNIX market grew by more than 12%, with the combined small and mid-range systems totaling roughly 20% growth.

Although 1995 was expected to be a year of major battles between UNIX and Windows NT, IDC saw only skirmishes. OS/2 and NetWare bore the brunt of NT's attack. Shrink-wrapped UNIX took some hits, but it is not clear that NT was the main source of the damage. The UNIX small systems marketplace was not noticeably affected. Over the next few years, NT's attack will be a battle of attrition, not a rout by sweeping hordes.

With NT, Microsoft seems to have

solved the puzzle of how to sell a shrink-wrapped complex operating system. UNIX is still working on that puzzle. Most software stores now carry, or can order, NT Workstation or Server. The number of stores that carry any form of UNIX is very small. While enterprise-class software is rarely bought off the shelf, selling it over the counter makes a statement about its ease of installation and management. To compete with NT, shrink-wrapped UNIX needs to have to have that level of ease of use and channel access.

If the shrink-wrapped vendors are having problems, the custom bundled providers are doing fine. Suppliers that focused on a mutually tuned hardware and operating system package grew steadily. Small and mid-range systems — the systems in which F1000-class customers are investing — grew at a combined rate of almost 20%. This area will continue to be a major growth market.

Academic, governmental and commercial organizations have been involved in developing UNIX system software from the start. While this led to a robust, scalable, multi-vendor, multi-platform operating environment, it also meant that features and functions appearing on one UNIX implementation were not always immediately available on others.

This led to the market perception that UNIX variants were not compatible. Although there was some justification to this, the truth is that UNIX systems are more alike than different. Due to the efforts of X/Open, the Open Software Foundation, UNIX International and other organizations, unified UNIX standards were announced in 1993. Nearly every major UNIX platform complies with the UNIX 93 standard and is being tested for compliance with the UNIX 95 standard.

Why UNIX is so popular

UNIX is the most popular SOE for RDBMS-based applications and for use as a multi-function server. IDC believes this is due to the following seven reasons:

Applications: All of the popular applications have been available on UNIX for years.

Communications: UNIX supports a broad array of network media and network protocols, making it a solid network citizen and a good platform for server software.

Management: UNIX supports a wide spectrum of system and network management tools and frameworks.

Development: All the popular application development languages, application environments, database and middleware tools have been available on UNIX for years. UNIX was originally created to be a platform for application development.

Platforms: UNIX supports every major microprocessor architecture. It also provides robust support for SMP, MPP and clustered systems. Other SOEs lack this broad support.

Standards: Nearly every important industry, international, de facto and de jure standard first appeared on UNIX and then spread to other operating systems. Although many UNIX offerings have unique features, all major UNIX players are POSIX-compliant, adhere to the X/Open Portability Guide, Edition 4 (XPG 4), and have also been branded by X/Open as complying with UNIX 93 standards.

Track Record: Having supported both host- and server-based applications for over two decades, UNIX has established itself as a platform for personal, workgroup and enterprise-class applications.

IDC believes this intense standardization effort was undertaken by systems and software suppliers for two reasons: End-user organizations demanded a unified UNIX environment, and systems and software suppliers were concerned by Windows NT, an environment whose development was controlled by one company. UNIX suppliers realized that if they did not provide end users with a unified environment, they would lose sales to NT.

Dramatic changes

Developing a world-class UNIX operating system is an expensive proposition. IDC estimates that an organization must be willing to invest $75 million to $100 million a year — a cost beyond most companies. Until recently, the list of companies fielding a world-class UNIX operating system included AT&T GIS, Data General, DEC, HP, IBM, Novell, SCO, Siemens Nixdorf and Sun Microsystems.

THE TRUTH IS THAT UNIX SYSTEMS ARE MORE ALIKE THAN DIFFERENT.

But last September's UnixExpo dramatically changed how shrink-wrapped, high-volume UNIX operating systems are developed. At the trade show, Hewlett-Packard, Novell and SCO jointly announced a set of partnerships to deliver a high-volume UNIX with NetWare and enterprise services. [For more on this product, see the following article.]

IDC believes that all three companies came out winners. HP gained a greater focus on the X86 software market prior to the delivery of the Intel/HP-PA merged architecture. Novell gained a better focus on its network server and network technology business. SCO gained new growth opportunities and new technologies but must now manage a more complex development process.

Since the combined 1995 license shipments of SCO OpenServer, SCO UnixWare and HP-UX represent 51.6% of all UNIX license shipments, a smooth migration path from today's products to tomorrow's unified high-volume UNIX is crucial to end users and developers. This process will be facilitated by the high level of compatibility between OpenServer and UnixWare Version 2. SCO's product road map will facilitate this migration.

Although new information technologies seem to appear daily, core business applications evolve slowly. Companies cannot afford to shut down their business operations to restructure their information processing infrastructure. IDC expects computing environments throughout the remainder of the decade to be built upon the structures seen today. These future computing environment will consist of platforms supporting personal productivity, the Intranet (single company network) and the Internet (multi-organization network). Each platform different work to do and may use a different microprocessor, operating system, application environment, etc.

Personal productivity platforms empower personal productivity, a foundation for distributed applications. Handheld, portable or desktop systems, they may stand alone or connect to other systems via a direct cable connection, phone line, ISDN or even a radio link. Today these systems are most likely Intel X86-based, running a Microsoft operating system, IBM OS/2 or UNIX. The most common non-Intel systems are Apple Macintosh. These will continue to be the typical desktop systems for the rest of the 1990s.

Intranet platforms support an organization's decision support, data warehousing and business transaction processing. These systems can be a single-vendor environment, i.e., IBM mainframes, AS/400s or Digital's OpenVMS/Alpha systems, but are increasingly UNIX-based — no matter if the system is based on Intel X86, HP Precision Architecture, IBM Power Architecture (which includes the PowerPC) or another architecture. Since standards-based open computing environments offer interoperability, transportability and price/performance advantages, IDC believes that UNIX will continue as a key platform.

The remainder of the decade will bring fierce competition, with several microprocessor architectures fighting for supremacy. The dominant architecture in terms of unit shipments is Intel X86. With Intel and HP to jointly introduce their 64-bit successor to the current 486, Pentium and Pentium Pro, IDC expects this architecture will continue to hold the top position, while the PowerPC, the joint creation of Apple, IBM and Motorola, will remain the "loyal opposition."

As companies adopt P7-based systems, they will likely select the unified UNIX operating system from SCO, Novell and HP.

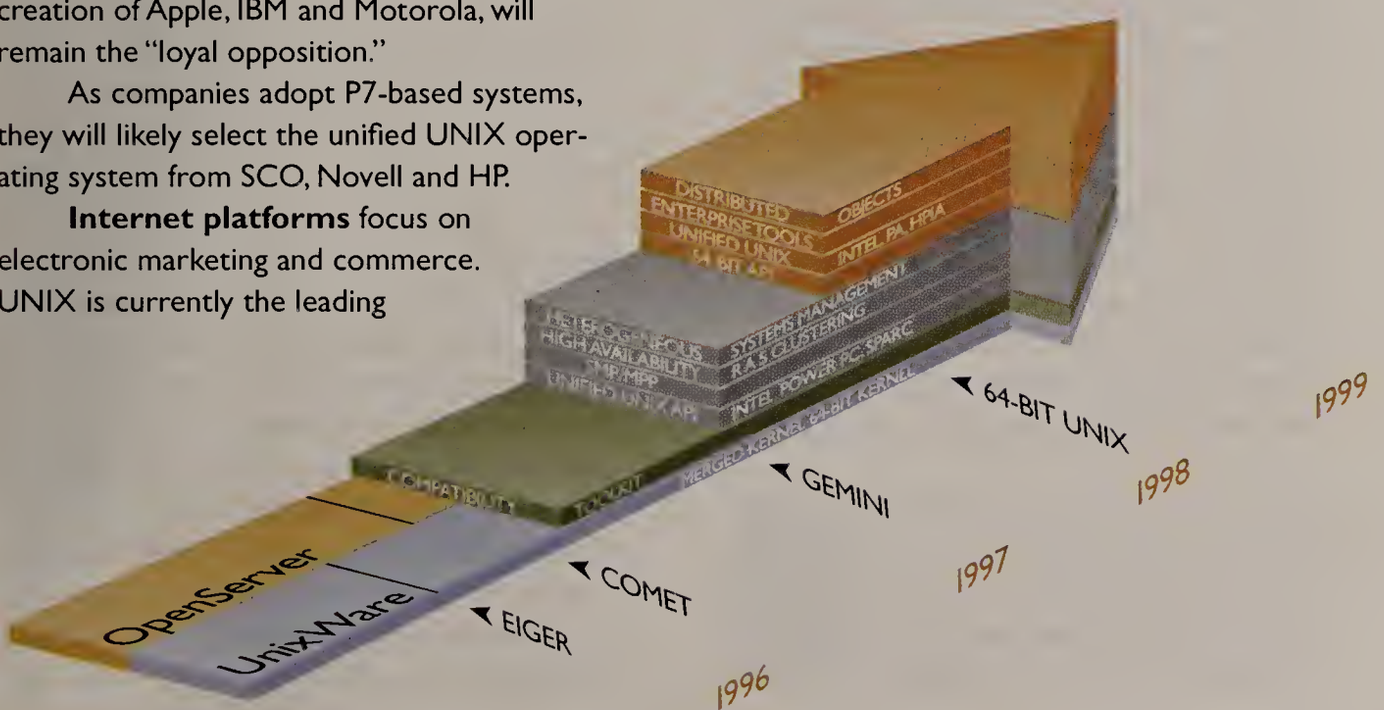
Internet platforms focus on electronic marketing and commerce. UNIX is currently the leading Internet operating system, although it is seeing competition from NT and other operating systems. Since UNIX already supports all the important network, security, database and application standards in this area, it is likely to hold onto the top position for the remainder of the decade.

THE REMAINDER OF THE DECADE WILL BRING FIERCE COMPETITION, WITH SEVERAL MICROPROCESSOR ARCHITECTURES FIGHTING FOR SUPREMACY.

Although it is hard to predict which technology will become important in the future, it is more than likely that UNIX-based systems will support that technology. IDC believes UNIX will continue to hold a central position in many organizations' IT plans. ■

Figure 4

The SCO Product Roadmap



The road to Gemini: a product roadmap

By Scott McGregor, Santa Cruz Operation

Now that SCO has purchased the Unix business from Novell, where do we go?

By leveraging its proven ability to bring high-volume Unix to market, SCO will consolidate SCO OpenServer and UnixWare into a merged high-volume Intel UNIX operating system, code-named Gemini. Gemini will also include certain HP-UX features.

GEMINI WILL ENABLE SCO DEVELOPERS, ISVS AND IHVS TO REDUCE THEIR APPLICATION PORTING AND TESTING COSTS, SHORTEN TIME TO MARKET, REDUCE ONGOING SUPPORT AND MAINTENANCE AND ENABLE THEM TO APPLY A SINGLE OPTIMIZATION EFFORT TO MULTIPLE PLATFORMS.

SCO's acquisition paves the way for it to integrate SCO OpenServer and SCO UnixWare systems with Novell NetWare file, print, and directory services, plus other emerging technologies, to offer customers a standard UNIX system. SCO and HP are jointly driving the development of a modular 64-bit operating system using ASPEN, the 64-bit UNIX standard API, for the next-generation Intel processor.

The 64-bit UNIX system will incorporate technology from SCO UnixWare, SCO OpenServer and HP-UX, ensuring the creation of a dominant, industry-standard server operating environment with a single consistent interface for applications across several platforms and advanced network services for multi-tiered client/server computing.

Gemini: The Merged UNIX System

SCO is currently in the process of architecting Gemini, which will create a unified environment that integrates the best capabilities of SCO OpenServer and SCO UnixWare (and some features of HP-UX) into one scalable UNIX for businesses of all sizes. Gemini will include key networking services from Novell that will be in the next release of UnixWare. It will also add features to address the areas of high availability, systems management, performance and scalability.

Gemini will help SCO developers, ISVs and IHVs to reduce their application porting and testing costs, shorten their time to market, reduce ongoing support and maintenance, and enable them to apply a single optimization effort to multiple platforms. Once OEMs license Gemini for their own platforms, an ISV will be able to develop a database for only two or three Unix platforms instead of 14 of them. These companies will also gain access to more distribution channels and be able to take advantage of enterprise sales opportunities created by the various OEM sales forces.

The three key advantages of Gemini are scalability and performance for business applications, high availability to maximize system uptime, and proactive systems management. Gemini addresses these issues through:

NUMA (non-uniform memory access architecture): Leverages Intel's Pentium Pro technology so industry-standard PCs can be used to build large-scale UNIX systems. It enhances the scalability of the Pentium Pro, which has native support for 4-node clusters, so as to create a 16-node cluster that offers high availability. It also allows very large memory models, by breaking up the address space of memory, while providing the system with a contiguous memory view. A large database would operate as though it were running on one large shared-memory SMP system.

System monitoring and alerts: The ability to monitor activities in a server or

application environment, and correct problems proactively, is critical for a company that has 2000 sites but performs all its IS management from one site. IS managers need to know about problems in advance so they can fix the problem before the system goes down.

Resource Quotas: Allow a systems administrator to define limits on the amount of a system resource that a user or application can use. For instance, the amount of disk space a user is allowed can be pre-assigned. The system warns the user when that limit approaches and forces the user to free up space before being able to save more data.

Hardened device drivers: These enable the drivers and operating system to recover, without incurring downtime, in case of a failed hardware device such as a disk or network interface card. Gemini will support hot swapping of such hardware without bringing the system down.

Dynamic RAID: Today's systems force a user to choose on the type of RAID depending if they want availability or performance. Gemini users will be able to choose the type of RAID depending on whether they want to do a read or a write operation.

Milestones On the Road to Gemini

There will be three milestones along the road to Gemini: Eiger, Comet and the Gemini Software Development Toolkit (SDK).

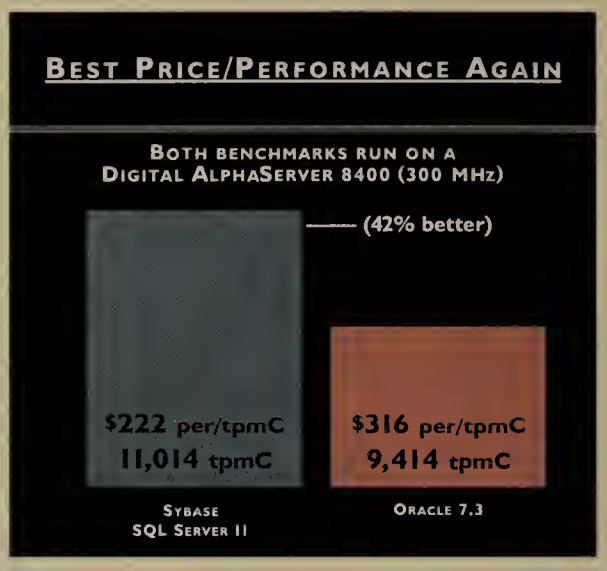
In the first quarter of 1996, the next release of SCO UnixWare, code-named Eiger, will become available. Eiger will increase SCO UnixWare integration with PC clients via enhanced support for NetWare 4 file, print and directory services, doing away with the need for a separate NetWare server. Eiger will also act as an application server for NDS-aware applications and a communications gateway to NetWare Connect Service for wide-area networking. This release will make it easier for companies who are planning to consolidate separate application and file/print servers onto one larger hardware platform.

SCO OpenServer is today's leading Unix operating system for running business-critical applications on Intel-based platforms. The next release of SCO OpenServer System, code-named Comet, will become available in the third quarter. This release will provide the foundation for customers and application developers to evolve their SCO OpenServer solutions to Gemini. Comet will also include new features that address the requirements of high-performance servers, Windows client integration, and business-critical applications.

Gemini Software Development Kit (SDK)

SCO will also encourage Gemini application development by providing developer tools on both Eiger and Comet. Developers will be able to create the same application for existing SCO OpenServer and SCO UnixWare platforms. Also, the SDK will include tools to identify interfaces used in an application that might require changes with Gemini. A kit will allow hardware vendors to create drivers for Gemini, then make those drivers available for Eiger and Comet. And it will enable developers to create a single application that is binary compatible on all three SCO platforms: Eiger, Comet and Gemini.

Scott McGregor, SCO's Senior Vice President for Products, has responsibility for product P&L, product strategy, product marketing, and related strategic ISV/OEM relationships.



Another apples-to-apples comparison. (*Our apples were faster.*)

It seems to be happening a lot lately. New Sybase SQL Server™ 11 goes head to head—on the same machine—with the latest software from Oracle. Software they're not even shipping yet. And guess who wins. That's right. Sybase. This time on Digital. It's no wonder businesses that depend upon the best price/performance depend on us. So call 1-800-8-SYBASE, ext. 27449, or check out our Web site at http://www.sybase.com/. And see more examples of how our apples keep turning their apples into sauce.

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Computer Industry

Briefs

SyQuest layoffs

Removable disk drive vendor **SyQuest Technology, Inc.** in Fremont, Calif., has laid off 60% of its workers, or 2,600 people, in the U.S. and Far East. The company also is looking for a new president and chief operating officer as it restructures operations. The moves follow a loss of $33.8 million on revenue of $78.7 million in its first fiscal quarter ended Dec. 31. The company blamed the loss on a transition to new product lines, which have lower gross margins.

No thanks

U.S. Robotics Corp. said it is no longer interested in acquiring **Hayes Computer Products, Inc.**, which has been in Chapter 11 bankruptcy since last October. One plan still afloat by Hayes' creditors is for Diamond Multimedia, Inc. to buy Hayes for $111 million.

AOL posts profit

America Online, Inc. last week reported $249 million in revenue and $10.6 million in earnings in the quarter ended Dec. 31, more than triple the revenue from the same quarter a year ago, when AOL lost $38.7 million.

SHORT TAKES Bringing the total executive exodus to at least 11, Jeffery Beir, senior vice president at Lotus' applications business, and Russell Campanello, vice president of human resources, have resigned from **Lotus Development Corp.** ... John Medica, vice president of the portable group at **Dell Computer Corp.**, was named vice president and chief operating officer of Dell Japan. ... **Lucent Technologies** is the new name of **AT&T Corp.**'s previously nameless $20 billion equipment company. That company will be spun off later this year.

Leading Edge back under fire

Class-action suit charges fraud

By Jaikumar Vijayan

A class-action suit filed last week against fading PC maker Leading Edge Products, Inc. could serve as a shot across the bows of its peers. But it is unlikely to trigger a spate of me-too litigation from corporate users.

The suit, filed by three users seeking to represent all Leading Edge customers, accuses the Westboro, Mass.-based company of fraud, deceptive practices and breach of warranty contracts.

According to an attorney representing the plaintiffs, Leading Edge refused to provide its customers with the adequate and timely technical service and support they had been led to believe they could expect.

Leading Edge could not be reached for comment.

Vendor help desks and services in general have been the target of a growing number of complaints, particularly from the small business and home markets, analysts said. In the past, on-line user groups of even some of the more established vendors — such as Gateway 2000, Inc. and Zeos International — have been filled with tales of support-related woes.

Vendors are seeking to differentiate themselves by increasing their services, but they open themselves up to this kind of user anger if they fail to deliver.

"People have been mystified by computers for many years," but as some of that mystery wears off, consumers will begin to take vendors to task for failing to deliver on promises, as with any other industry, predicted Dan Drachler, a lawyer at Zwerling, Schachter, Zwerling & Koppel. The New York firm is representing the plaintiffs in the Leading Edge case.

Raked over the coals

A partial list of the charges against Leading Edge:

- Violated the federal Magnuson-Moss Warranty Act, which says manufacturers must remedy defects, malfunctions and other failures within a reasonable time
- Violated its own warranties by failing to honor them
- Commited fraud by knowingly making support promises it couldn't keep to persuade people to buy its systems

Lessons for others

Indeed, last week's suit should serve as a cautionary tale, analysts said.

Customers now have higher expectations for service and support, said Helen Dragoon, an analyst at International Data Corp. in Framingham, Mass. "Vendors have to be very careful about the kinds of promises they make and the way in which they position their services," she said.

Such support issues are unlikely to affect corporate users in a big way, however, said Priscilla Tate, executive director of the Technology Manager's Forum, a user group in New York.

"You are dealing with a different mind-set here. People who are buying computers for large corporations make sure up front that the people they are dealing with have the right credentials.

"And the vendors know that these customers have the resources to litigate if they have to," she said.

Find the pattern

Leading Edge's customer woes go back a long way, according to industry observers. The struggling box maker — which last year sold 90,000 units — has faced customers irate about issues from lost deposits, failed components and unreturned telephone calls to machines that are dead-on-arrival.

"They deserve this. Over the years, I have heard a litany of bad experiences from users who have tangled with the company," said Priscilla Tate, executive director of the Technology Manager's Forum.

Siemens/Pyramid team seeks to raise profile

By Michael Goldberg

The acquisition last March of Pyramid Technology Corp. by $9 billion Siemens Nixdorf Informationssysteme AG quashed doubts about Pyramid's viability as a systems vendor. The merged firms' goal of reaching top-tier status in the computer industry also could turn out to be a steep climb in dry sand, however.

In the past year, Pyramid in San Jose, Calif., and Germany-based Siemens Nixdorf have merged their Unix-based product lines and launched a data warehousing program that targets retailers and telephone companies. The companies announced Jan. 29 that in March they would ship Reliant Unix, a 32-bit, Unix 95-compliant combination of Pyramid's DC/OSx and Siemens' Sinix operating systems.

Such moves make corporate sense, demonstrate competitive technology and generate applause among Pyramid users. But it is everybody else that Siemens and Pyramid must worry about if they want to grow beyond their $500 million U.S. sales base, analysts said.

"Regardless of whether the new consolidated product offerings are under the Siemens or Pyramid name, they'll face an uphill battle. Siemens is a virtual unknown for commercial systems [users] in the U.S., and there are so many other entrenched competitors," said Brian Richardson an analyst at Meta Group, Inc. in Stamford, Conn.

For example, familiar suspects among multiprocessor server vendors — IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and Digital Equipment Corp. — already pack a mind-share punch for information systems decision-makers who may not be familiar with Siemens or Pyramid, analysts said. Moreover, the Siemens/Pyramid team lacks a clear overall product strategy.

Pyramid CEO John S. Chen *is working on a unified product strategy*

John S. Chen, Pyramid's CEO, said Siemens and Pyramid are working on that point by forming an Open Enterprise Computing Group that he will lead.

"We will have to come up with a strategy," Chen said. He added that a lot will depend on software developers: Applications for Windows NT will be offered on the Intel platform, while others will be packaged for Reliant Unix.

"We [also] have a project to bring Reliant Unix capabilities and functionality onto the Intel platform," Chen said. But he didn't specify when that would reach the market.

Chen said the companies expect to gain market ground every year by targeting specific industries with hardware and software packages from companies such as Informix Corp. and SAP AG and other equipment, including telecommunications products, that Siemens makes.

Pyramid's technology sold Syd Farber, a technical consultant at Wang Laboratories, Inc. in Tewksbury, Mass., on the company's new midrange RM 400 server for its SAP R/3 application. Farber said his company picked the RM 400 Pyramid over HP because Pyramid's older version of Unix offered better failover capabilities in case a server crashed.

Pyramid "is going to be around for many years," Farber said. "They're going to invest in new technology, new tools, and they're going to be able to build up its application base."

HP catches up in Unix clustering. See page 37.

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Editorial

Cable ready

Yes, I suppose I should join the chorus singing praise to Congress for "boldly" passing the Telecommunications Deregulation Act.

It would have been a better idea to be so bold, say, five years ago, when virtually the same dynamics that underlie the telecommunications business today were in place. But when that sorry crew in Washington acts responsibly, it's the exception, not the rule. So let us join in the applause: The tired, century-old body of monopolistic telecom practices is in its final convulsion.

This isn't good news for some of the regional operating companies, the so-called Baby Bells. They've used their monopoly power in providing local communications access the way U.S. steel companies used trade protectionism in the 1960s: They innovated as little as possible yet grew plump on monopolistic spoils. Can you imagine a $10 billion-plus privately held company operating in a market in which competition is outlawed? That's pretty much how the Nynexes and Bell Atlantics have had it for years.

It's true the Baby Bells can now offer long-distance services. But that's been a competitive market for more than a decade. They've had their own merry way in the local loops. Read the testimonials of frustrated would-be ISDN users, and you get a sense of what "service" means to a monopoly provider.

But the most exciting and potentially fruitful aspect of the legislation is the provision that allows cable companies to offer telecom services. This provision will provoke scores of mergers and buyout activity, the targets being the hundreds of cable providers across the country. In lockstep with this will be a full exploitation of bandwidth-beefy cable TV lines. Once security issues are resolved, data will speed in and out of homes at a mind-numbing 25M bit/sec.

Suddenly, an array of services only dreamed of becomes viable and affordable. Entire industries, such as retailing, could be reshaped and redefined because of a ready-made infrastructure to support new applications. This phenomenon of exploding bandwidth will revolutionize the IS domain far more than the plummeting telecom rates that will result from deregulation.

Sadly, the dark forces of regulation aren't totally dead. A convoluted body of state laws, as different from one state to another as, say, Utah is from Mississippi, apply to telecom and cable access providers.

Still, what Congress has decreed, no state shall put asunder. This is simply the best, most possibility-laden news to come into the IS world in quite some time.

Bill Laberis

Bill Laberis, *Editor*
Internet: *bill_laberis@cw.com*

Letters to the editor

Microsoft and the free market

John Davidson frets about free and open competition ["Microsoft endangers TCP/IP standard," CW, Jan. 15]. Why run to the Justice Department rather than design the best product your firm knows how to produce, Mr. Davidson?

You said, "There's nothing wrong with Microsoft offering TCP/IP software free of charge, as long as it isn't bundled with Windows 95 and must be specifically acquired by the user." That's mighty big of you, telling others what they can and can't do. Should all manufacturers of hardware or software not bundle any additional features onto their existing products and be required to force users to "specifically acquire" them free of charge?

I suggest instead that there is nothing wrong with other participants in the open marketplace trying their best to design whatever is worthy of purchase. Take a clue, Mr. Davidson — self-serving marketplace protectionism is on its way out.

Barry Kurth
Boston
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Microsoft does bundle TCP/IP with its operating system, but I, like many others, have opted for other, better products. I believe that I have the intelligence to make a decision on my own. I don't need the Justice Department putting its nose into every move a big technology company makes.

Competition is the base of our business ideologies. While sometimes the big boys don't play fair, I would hate to see the legal vultures take control of the technology world. It wouldn't be right to tack 500% on to the price of software just to cover legal costs.

Steven Whyte
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As someone with a vested interest in the market for communications software development, I can sympathize with Davidson's concern that Microsoft's offering of TCP/IP as freeware is having a profound effect on the marketplace.

But rather than try to impede the inevitable, internetworking companies might be wiser to refocus on new areas of distributed systems. The energy redirected into new, creative ventures may lead those firms to greater riches than would retaining a focus in a market whose landscape has been altered dramatically.

Microsoft may dominate a market segment right now, but who's to say it will go on forever? Past market leaders such as IBM and Digital have fallen and have had to reinvent themselves. Perhaps one of the advantages of independent developers is that they are light on their feet.

It is unlikely that Microsoft will be able to completely control the TCP/IP standard.

With companies such as Cisco, Bay Networks, Sun Microsystems and others providing internetworking equipment, it will be difficult for Microsoft to effect the kind of change on standards that Davidson fears. Microsoft is in the desktop and back-end markets and isn't as significant a force in the exchange services market.

Past history indicates that nothing, including Microsoft's dominance of the computing industry, is forever.

Mike Rodbell
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Year 2000 problems lurk in PCs

In response to Wayne Socha's letter [CW, Dec. 18], it would be nice if the year 2000 were isolated only to mainframes.

I work at a small college where we have no mainframes but many flavors of "generic" IBM-compatible PCs, none of them big names. I tested the date and time problem on several different machines, and they *all* came back with 1/4/80 as the date.

Fortunately for us, we are small enough that we do very little internal application development, so we just pass our year 2000 headaches on to our software vendors and pray they get it all working in time.

Greg Matthews
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■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Chris Miksanek

My name is Chris, and I'm a PC pack rat

He kicked the megabyte habit, and so can you. Here's the recovery program.

For as long as I can remember, I've collected PC files. I have never deleted anything. My 120M-byte hard disk drive would no longer do. I graduated to 360M bytes, 520M bytes, 1G byte and then to a second hard disk. It seemed that nothing could satisfy my hard-disk requirements. But the company I work for relocated me last summer, and my whole PC world collapsed.

The company's PCs are owned by specific business departments; when I changed offices, my high-powered PC stayed behind. In my new cubicle was a brand-spanking-refurbished 386-based PC with an 80M-byte hard disk. In its day, that was quite an impressive box. Its day was July 16, 1987. Today, it's not much.

Fast-forward to last week. I was discussing with a colleague how surprised I was that I didn't really miss my old stuff. In that one moment, I realized I had kicked my megabyte habit. I had gone seven months without the files I had spent years accumulating — and I survived. And you can, too.

I can't recommend the cold-turkey method for everyone. But here is a seven-step recovery program, which I'll be promoting on late night infomercials. Adhere to the following simple plan, and you'll never have to upgrade again:

1. Self-assessment. List the files on your hard drive with a cataloging utility. If you're like me, one of the first things you'll notice is that you have five cataloging utilities. Review the files with a co-worker or significant other — make an afternoon out of it. You'll try to justify each file, but if you don't sound very convincing, then you have some candidates for the trash can icon. (Personally, I found it difficult to rationalize the 61M-byte folder of graphics from the *Mod Squad*, QuickTime movie clips from box-office flops and sound files from "Marcel Marceau Live at the Met.")

KATHRYN ADAMS

2. Make a journal of your progress. There's a chance that as you banish files to Cyberia, you may be a little overzealous. Use one of the nine text editors you've collected to keep track of all you've deleted, where you got it and how you could recreate it. This way, when you delete something that might come in handy later — oh, say, OS2.INI or some other critical file — you're not up the proverbial creek.

3. Eliminate slack. Compact your trash files into an archive by using one of the 12 compression utilities you've amassed. You may have reclaimed most of your hard disk, but don't stop.

4. Off-load that excess baggage. If you find you don't really miss the compressed files, transfer them to some of those junk diskettes you've stockpiled. They're the ones with the half-scraped-off labels you've saved from vendor pitches and old program installations.

5. Take that big step. Throw away the archive diskettes. This takes the burden off your hard drive and gets rid of the scratch diskettes you saved, which really weren't worth saving. I was kidding in step No. 4, but you accept this as truth.

6. Self-evaluation. Pat yourself on the back if you deleted the original files when you created the archives. Kick yourself in the behind if you used an "undelete" program to recover everything you deleted.

7. Maintenance. Repeat steps 1 through 6 every month. You thought you were home free, but this is a pathological problem that requires sustained maintenance. It's like a weight problem. You don't diet just once; you diet for life.

Miksanek is a programmer in Rochester, Minn. He keeps a stack of 5¼-in. floppy diskettes that are just too good to throw away.

Michael Schrage

Facilitation: Powerful job with a wimpy name

The digerati can't buy a clue about what their business clients want.

Much like "empowerment" and "validation," "facilitation" is one of those squishy-soft, let's-all-hold-hands-and-sing-"Kumbaya" kind of words that respectable propeller-heads understandably loathe. Facilitation reeks of communing with one's "inner hacker" more than delivering crackerjack code on time and on budget.

But let's be blunt: Most software developers today lack the competence to do much more than craft credible code. Their grasp of business agendas barely qualifies as kludge. Their ability to collaborate with internal clients is about as compelling as their willingness to document.

A gifted facilitator can steer a RAD team away from the infamous "prototyping death spiral."

At a time when rapid application development (RAD), rapid prototyping and business objects/components dominate design discussions, the digerati can't buy a clue about what their clients really want. Meanwhile, their clients are too technically obtuse to articulate what they really need.

Consequently, more companies are willing to acknowledge the reality that building client/server "teams" of people who inherently can't communicate with one another constitutes management idiocy. As Woody Allen once observed, "The lions may lie down with the lambs — but the lambs won't be getting much sleep." Similarly, software jocks can be in the same room as business folks, but that doesn't mean anything productive emerges.

That's why facilitators are increasingly becoming a part of major client/server RAD initiatives. No, they aren't there to help people get in better touch with their feelings. They serve as the conduits — and lightning rods — between designers who don't understand business and businesspeople who don't understand design.

It's sad but true that for most development organizations, a decent facilitator is worth more than a handful of Microsoft Visual Basic and/or C++ programmers. For that matter, a gifted facilitator often is capable of making even the most pea-brained of clients intelligible.

Competent facilitation can successfully steer a RAD team away from the infamous "prototyping death spiral," where client and techie endlessly iterate in software what they think the other is saying. Talented facilitators make project management and expectations management more, umm, manageable.

All that said, the rise of facilitation is an unfortunate trend. As useful, helpful and vital as a practiced facilitator can be, facilitation is really an admission of defeat.

In the well-managed organization, project managers and/or their clients would always bring facilitation skills and savvy to the table. Prototypes would be used as a medium to evoke shared understandings rather than functionality feuds. The effectiveness of outside facilitation represents the impotence of internal management.

Even worse, too many organizations that use facilitators discover (to their horror) that participants delegate their sense of responsibility to the facilitators. The facilitator turns into a mediator or — even worse — an arbitrator. That's akin to letting a translator shape the content of an arms-control negotiation. The problem is that facilitation becomes a way for individuals to abdicate their responsibilities to communicate, cooperate and collaborate.

In truth, most system development organizations would probably be far better off if they exposed their people to well-facilitated development meetings and reviews — and insisted that these are the sort of values that all co-development teams should practice.

Schrage is a research associate at the MIT Media Lab and author of *No More Teams!* His Internet address is schrage@media.mit.edu.

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Cluster luster

HP may take lead in managing harnessed groups of servers

By Craig Stedman

The tortoise is catching up to the hares in the race to deliver technology for clustering Unix servers.

Hewlett-Packard Co. may even be pulling ahead of most other server vendors in the important area of cluster management. Later this quarter, HP's OpenView network manager will be able to control harnessed groups of servers — a step that chief rivals Sun Microsystems, Inc. and IBM haven't taken yet with their own management products.

"HP is not behind the crowd this time," said Jonathan Eunice, an analyst at Illuminata, Inc. in Nashua, N.H. Thus far, only Data General Corp. has come up with a similar eye into clustered systems, Eunice said. Sun and IBM are still limited to stand-alone server management that doesn't recognize the oneness of clusters.

The cluster-friendly version of OpenView, called ClusterView, was a key piece of a bulked-up Unix clustering strategy that HP announced last week. The number of servers that can be lashed together in its MC/ServiceGuard clusters doubled to eight, and several other features were added (see chart).

Until it introduced MC/ServiceGuard a year ago, HP was barely credible when it came to clustering — allowing multiple machines to function as a single computer. Companies such as IBM, DG and Sequent Computer Systems, Inc. were faster on the draw, and HP's first shot at clustering didn't perform well. But the company has largely closed the technology gap in the past 12 months, analysts said.

"That's typically the way HP does things. They're never first, but they're usually the best with what they eventually get to market," said Dwight Wolfe, manager of Unix systems at CNA Insurance Co.'s Personal Lines division in Chicago. The CNA unit installed two-node HP clusters in its Dallas and Reading, Pa., offices in the past few weeks, and it plans to put eight more server tag teams in Reading this year.

The clusters will run a client/server policy administration application that is replacing a mainframe-based system. HP's failover capability worked as promised when one of the Dallas servers was mistakenly turned off, and configuring and installing the clusters was relatively painless thanks to scripts provided by HP, Wolfe said.

ClusterView "is just icing on the cake," Wolfe added. "Letting our operations staff watch the clusters on a screen will be another form of backup."

The Personal Lines division bought the Operation Center piece of OpenView for day-to-day server administration. Including the clusters is vital because those systems will be managed remotely from Chicago, Wolfe said.

The management tool gives network administrators an icon-based view of a cluster that can be used to detect failures and to rebalance workloads on the remaining servers, HP said. ClusterView ships this quarter with OpenView's Network Node Manager Remote Monitoring module; Operation Center will follow by midyear. OpenView Administration Center, which handles server installation and start-up, is due to get cluster support late this year.

All together now

HP's announcement includes the following clustering and high-availability technologies:

Technology	Availability
Number of servers in MC/ServiceGuard clusters increased from four to eight; low-cost serial line link added	Now
OmniBack II backup management tool integrated with backup utilities in SAP R/3 and relational databases	Now for R/3; first quarter for Oracle, Informix, Sybase
Preconfigured clusters for R/3, World Wide Web and other applications	Now through third quarter

Cache rich

Don't buy a whole new server. Take the cache instead.

That is HP's advice to users of its midrange K class systems who are bumping up against the performance ceiling. HP last week added two faster K class models with expanded processor caches.

The K220 and K420 have 2M-byte caches, four times more than that offered by other models.

Customers with other K class machines can trade up to the more cache-rich processors through an in-cabinet upgrade. It includes a full list price credit on the CPUs being swapped out, HP said.

The addition of the K220 and K420 keeps HP one step ahead of its server rivals on throughput, said John Logan, an analyst at Aberdeen Group, Inc. in Boston, "and the fact that they can do it with cache makes it totally transparent to customers." — *Craig Stedman*

Intel's motherboard key to server strategy

By Bob Francis

By the end of this quarter, Intel Corp. will begin shipping symmetrical multiprocessing (SMP) server motherboards, a key component of the company's high-end computing strategy.

SMP processing

For corporate information systems departments, the ultimate payoff from Intel's strategy will be lower-cost SMP processing. With large SMP systems, IS departments can expand the scalability of PC servers, letting the machines be deployed for large database and office applications. The Santa Clara, Calif.-based chip manufacturer said prices for low-end Pentium Pro servers should be equivalent to Pentium servers, or approximately $6,500, by the end of the year.

As it makes these moves into high-end computing, Intel has made changes to its business model as well. The company now often briefs large users on upcoming products and announcements, similar to how IBM and other large vendors do.

And Intel has to act a bit like those vendors as well, trying to set standards such as the nonuniform memory architecture, a method of memory addressing that speeds up multiprocessing.

As a standards arbiter, Intel often rubs its own partners, such as Microsoft Corp. and Compaq Computer Corp., the wrong way. Intel also provides reference designs for companies, such as Compaq and Advanced Logic Research, Inc., that continue to develop their own server designs.

"Intel has to maintain some control on the components so that these systems have enough uni-

Intel, *page 39*

Digital ups its PDA power

By Michael Goldberg

Personal digital assistant (PDA) users frustrated by platform limitations could get help from Digital Equipment Corp.'s StrongArm, a microprocessor designed to give high computing performance at low voltages.

Indeed, Digital officials said they have spoken with Apple Computer, Inc. about including the 32-bit StrongArm in the next version of the Newton PDA and with Oracle Corp. about an Internet access device. Representatives of Apple and Oracle praised the processor but declined to say whether they will use it.

"A lot [of our interest] has to do with the performance possibilities. The speed of it is just phenomenal," an Apple spokeswoman said.

Analysts said they expect Apple and Oracle to use StrongArm because it outperforms other chips in its class by five times.

"You're talking Pentium performance on a penlight battery," said analyst Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

StrongArm would give 10 times the processing performance of the current Newton, said Jim Turley, senior editor of "The Microprocessor Report," a newsletter in Mountain View, Calif. Competitors such as NEC Corp. and Toshiba Corp. make chips based on the R series of processors from Mips Technologies, Inc., but the

StrongArm, *page 39*

Clock speeds available:
100 MHz, 160 MHz and 200 MHz

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Panel Moderator:
Gay Slesinger
Vice President
Giga Information Group

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Panel Moderator:
Tim Andrews
Vice President
CSC

Examine how the latest in converging communications technologies has been implemented to meet challenges faced by top corporations worldwide.

Hear candid discussion on building infrastructure, deploying high-speed communications, internetworking and implementing new broadband applications, which combine voice, data and images.

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Panel Moderator:
Alan Alper
Editor
Computerworld
Client/Server Journal

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Panel Moderator:
Maryfran Johnson
News Editor
Computerworld

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DCE and Open Systems: A Bright Future

The Success of DCE

Momentum for the Open Software Foundation's Distributed Computing Technology (DCE) continues to build. There is perhaps no more vivid testimony to this than the growing production usage of the technology by end users. This is the focus of the articles you will be reading in this supplement.

These production stories span multiple industry segments, including telecommunications, manufacturing, finance, utilities, insurance and on-line services. There are interviews with executives of major corporations as well as the U.S. Government discussing their DCE implementations. The articles in this supplement are a testimony to the success of OSF's DCE technology as well as the commitment to Open Systems by end users and vendors.

Currently, DCE is being supported by every major systems vendor and an increasing number of software vendors. It is being shipped or availability has been announced on all major platforms, including UNIX, MVS, Windows, Windows NT, VMS and OS/2.

The Open Systems Industry: What's Next?

OSF and its open systems technologies, such as DCE, have enabled organizations to break down the barriers between diverse and incompatible systems. As a result, users have been given the freedom to choose the systems and technologies that best meet their business needs — regardless of vendor.

A new era of cooperation is being forged between a number of Open Systems industry organizations that will bring new initiatives within these groups and encourage cross-program synergies as well as increase resources to the highest leveraged activities. For example, organizations such as OSF, UniForum Association, UNIXWARE Technology Group (UTG) and X/Open Co. are participating in the Open Systems Pavilion at UniForum in February, offering "one-stop" access to information about the associations helping to lead the Open Systems movement.

And, history is being made as OSF and X/Open host the first "Joint Member Meeting," in San Francisco. By increasing the level of cooperation, and facilitating better communication and process management between the companies, OSF and X/Open are promoting consistency and commonality for Open Systems, benefitting members, ISVs and system vendors of both industry groups.

As you can see, the Open Systems industry is looking ahead to a bright future. For more information about OSF and its technologies or upcoming events, please contact OSF Direct Channels at (617) 621-7300 or email direct@osf.org. You can also find information and updates on the OSF Web home page URL: http://www.osf.org.

Peter B. Shaw
Vice President, Sales & Marketing, OSF

By Joe Maloney

The Exponential Growth of

A great deal has happened in the DCE marketplace over the past year. It is clear that DCE acceptance has grown in the market from the early days of prototype and evaluation use of DCE into an ever-expanding story of productions usage of the technology. This is the central focus of the many articles that follow.

In addition, there has been a tremendous amount of DCE activity in areas such as DCE-Web, which provides DCE security and directory services to the Web, and in the world of object-oriented technology, where DCE plays a major role in vendor implementations and plans. Several other DCE initiatives are also now underway, including the Federated Naming (XFN), a joint project with many of the major system vendors. This article will take a look at these developments.

"The U.S. Army alone has already publicly stated it expects to surpass $2 billion in DCE procurements over the next few years."

Over the past year, DCE source code adoption surpassed all projections, expanding the base of companies and other organizations that have chosen this technology. In fact, Input, a market research firm, has projected DCE market growth from a base of $50 million at the end of 1994 to more than $1.6 billion by 1999. This translates to a growth rate of 100 percent per year.

Although OSF and other DCE supporters were very gratified by these projected numbers, it now appears the DCE growth rate will surpass even these expectations. For example, the U.S. Army alone has already publicly stated it expects to surpass $2 billion in DCE procurements over the next few years. The fact that DCE implementations are shipped by most major system vendors, often bundled with their systems, will only add to this growth.

A very pronounced development over the past year has been the growing number of major companies moving from prototype and evaluation of DCE into production usage of the technology. Companies such as MCI, Schlumberger, Goldman Sachs, GE Capital, Corning Glass, GM/EDS, Caterpillar, Wheels Inc., Cummins Engine, Motorola, U S WEST, SECOM, Tokio Marine, Bellcore and many others from a wide range of market segments are currently using DCE. This growth in production usage is the most important element in the evolution of this technology.

There is a great deal of information available on OSF's home page at http://www.osf.org on these and other companies using DCE. For example, there are new DCE end-user profiles, new case studies emphasizing DCE in production use, a new product catalog, and information on the successful DCE Developers and User Conferences which were held in San Jose, Boston and Brussels during the past year. OSF also has DCE videos that describe the deployment of this technology by users in their production environments.

Recent DCE developments in three technology areas are particularly significant. in the area of the World Wide Web, in the area of object-oriented technology, and in the area with which DCE is most often associated, client/server technology.

In the ever-growing area of the World Wide Web, the DCE-Web project will enhance the value of existing Web technology, providing additional security as well as adding naming services. The goal of this project is to extend rather than replace existing Web based technologies. The development work is provided by engineers from both the OSF Research Institute and OSF Software Engineering and includes a multi-protocol Web/DCE Server as well as a Secure Local Proxy which can be used with unmodified off-the-shelf browsers to provide secure access, and a Secure

DCE Markets & Initiatives

JOE MALONEY
Director of Technology Marketing, OSF

Gateway. Interest in the DCE-Web technologies has been phenomenal, with financial sponsorship provided by a wide range of investor organizations.

DCE is also a key component of the object-oriented plans of many vendors. For example, IBM has committed to support DCE security time and directory services in SOM/DSOM within eight months. Hewlett-Packard is currently shipping its object-oriented DCE tool, OODCE, which provides a C++ IDL compiler and class libraries for DCE. Microsoft uses a re-implementation of DCE RPC, called MS-RPC, and has made it the basis for communication within its object model, COM/OLE. Over the past year, Microsoft has written a white paper on its use of and future plans for DCE. In the CORBA world, most vendors intend to use DCE RPC as an environment-specific protocol within the CORBA specification, to provide interoperability.

DCE's strength in the client/server community, where its use covers a wide spectrum from transaction processing, database connectivity and a growing DCE tools market, continues to accelerate DCE acceptance. One example is DCE's emerging importance in the message-based middleware market, where messaging technologies from IBM, Digital, and others will be taking advantage of DCE security and directory services.

Another significant development is OSF's Federated Naming project (XFN) which was developed in cooperation with SunSoft. This project, which has been joined by most of the major systems vendors, will allow systems and applications programmers to write to a single API for directory services, taking advantage of the different underlying naming services which their code will use.

DCE Release 1.2.1, available at the end of Q1 '96, continues to expand DCE deployment. This release provides further integration with existing environments such as Novell NetWare and Sun ONC, and offers additional features such as a C++ IDL compiler, allowing C++ programmers to write DCE programs.

The non-profit research and educational communities are an important element in the deployment of DCE, providing additional support, education and applications development for the technology. In the interest of proliferating DCE in these communities, OSF has announced a free source code license for non-profit research and educational institutions. Judging by the overwhelming number of requests OSF has received since this announcement, these communities are taking full advantage of this opportunity.

Another important element of OSF work has been the DCE Certification Program, which is moving ahead rapidly with certification already attained by IBM, Digital, Hewlett-Packard and Hitachi for a number of platforms. The DCE Interoperability Festivals offer a chance for vendors to prove interoperability with other vendors' systems. This is an important aspect for end users during the decision-making process, since it allows them to buy the DCE technology with confidence.

Looking back, it is clear that momentum for DCE continues to grow exponentially, with new production users, a growing market presence, new initiatives and the use of the technology in key areas such as the World Wide Web and object technologies. ■

Telecommunications

An Interview with Warren Bernard, Chief Architect, MCI Consumer Markets, MCI Communications

By Kathryn DeNitto, *DCE Technology Manager, Open Software Foundation*

How do you define distributed eomputing?

Distributed computing is the ability to solve business problems by using many computers spread across your network. It allows you to go ahead and take a business problem, divide it up into appropriate pieces, and have your network and your computers work collaboratively to solve it. It gives your workers access to the information and computing resources they need to do their jobs, regardless of the physical location of those resources.

What is the business of MCI Consumer Markets, and what are your corporate distributed eomputing needs?

MCI Communications is a $15 billion company that specializes in telecommunications products for consumers and businesses. We offer Internet products such as Marketplace MCI, as well as residential services, commercial services, and outsourcing arrangements for calling centers. We now are getting into cellular communications and local telephone service.

We're in a very competitive environment. Our main competitor is a $60 billion company, AT&T. We need all the strength we can get from our computing resources to deal with AT&T and other competitors in the national and international telecommunications arena.

We have to get our information to our people accurately, and we have to get new products out to the marketplace quickly. Our distributing computing approach with OSF's DCE allows us to do that — to go ahead and get new products and services out very fast in a cost-effective manner.

What led you to DCE?

Early on, the various departments within MCI would develop their client/server systems as they saw fit. Because of that, we now have a large number of machines from many different vendors running many different operating systems. DCE allows us to take these legacy systems and tie them together. We can leverage the old applications and build new applications, without having to go ahead and redo our hardware infrastructures. OSF's DCE was one of the enabling technologies that allowed us to overcome the chaos of the initial client server roll-outs.

Besides the ability to span legaey systems, what were your other eriteria for ehoosing DCE?

One of the things that we did when we were looking into a DCE architecture was an assessment of what was going on in the marketplace vis-a-vis use of OSF's services by various vendors. There were two areas where we found it to be absolutely key. One was in the area of objects. IBM and Hewlett-Packard have both said that they are going to go ahead and support CORBA 2 implementations with DCE as the underpinnings. Microsoft will have DCE RPCs (or their version of a DCE RPC) under COM/OLE. The second was in the area of Transaction Processing Monitors. Encina, CICS/6000 and CICS/9000 by Transarc, IBM and Hewlett-Packard, respectively, all will have DCE underpinnings.

When you go into the marketplace and see all of the people riding their infrastructures on top of a

WARREN BERNARD

"DCE allows us to take [our] legacy systems and tie them together. We can leverage the old applications and build new applications, without having to go ahead and redo our hardware infrastructures."

tool, DCE or otherwise, you have to pay close attention to what is going on. That was another one of the factors — besides the heterogeneous environment — that drove us to using a DCE infrastructure.

What role do standards play for MCI, and how would you characterize the marketplace today with respect to DCE?

With standards, the main issue is viability. The standard must be accepted by a large number of companies that have to put products into the marketplace and by the people who are going to use it. It is very clear that DCE is accepted now not only in the vendor community (Hewlett-Packard, IBM, Digital, Gradient Technologies, Open Horizon), but it's also being accepted by a large number of end-user companies and a large number of government agencies. That, more than anything else, says whether or not a standard is viable. So far DCE's viability in the marketplace has been doing nothing but growing over the last year.

Would you describe some of the DCE-based applications currently in production at MCI?

MCI Consumer Markets has designed two generic servers which any application code can tie into — a Credit Card Server and a Tax Server.

The Credit Card Server was set up with OSF's DCE as its main architectural foundation. This allows any application to make remote procedure calls, authorize a credit card for use by MCI, or to debit a person's credit card account if they buy something from MCI. In essence, the Tax Server functions in the same way. You send it an address and a shipping amount, and it will determine the correct tax for the jurisdictions involved at that particular address.

Both of these applications use DCE RPCs and they're working very well. As a matter of fact, I just put together an application that uses an AIX box. These applications normally run on a Digital VMS platform. It was very nice having IBM AIX RISC/6000 boxes talking to VMS boxes and none of the programmers had to do anything special for it.

And the "Hot Cut" application?

Our Hot Cut application supports our telemarketing sales force. MCI and the other long distance carriers are obligated by law to have a third party verify that the person who is on the other end of the phone agrees to the fact that MCI will be the carrier of choice. We developed an application called "Hot Cut" that takes the voice and the data of that sales phone call and transfers it to the third-party verification people. They will then validate the given sale for MCI. There are approximately 50 servers using DCE in different telemarketing centers across the United States, servicing approximately 5,000 people.

Telecommunications

An Interview with Warren Bernard continued

We felt that DCE was the best way to ensure good verification of our sales. The technology has enabled us to get a competitive edge over AT&T and Sprint.

How has DCE met your needs at the programmers' level? Does DCE contribute to system efficiency?

Yes, a couple of the things that DCE does are very nice. First, DCE's directory services allow us to go ahead and centralize our operation a set way, so that different applications can find out where they are supposed to be running. Second, in terms of efficiency, we don't have to worry when processes are down because DCE allows us to use process B if process A is down, and still keep my business up and running.

I was working on a project that needed to get information to our credit card server. I had the programmers write a DCE RPC out to the credit card server and it was up in 48 hours. We didn't have to start from scratch on the design, or build new server processes. I didn't have to have my programmers design everything. All they had to do was write to a set interface . . . and it worked!

One of the nice things about the DCE architecture is that my programmers didn't have to know about looking things up in a directory, doing security, formatting data or going from one type of box to another type of box. They just made the remote procedure call and DCE handled the things that needed to be handled. My programmers didn't have to get bogged down with learning all of the lower level calls to make that happen.

How widespread is DCE within MCI today?

Our DCE systems are utilized by approximately 8,500 people in 18 different locations. The OSF DCE tool set allows all of those people to utilize common core services that we have provided, such as Credit Card, Hot Cut and Tax Verification, and it allows our programmers to get products and services out to those 8,500 people a lot faster. ■

"One of the nice things about the DCE architecture is that my programmers didn't have to know about looking things up in a directory, doing security, formatting data, or going from one type of box to another type of box. They just made the remote procedure call and DCE handled the things that needed to be handled."

— Warren Bernard

Telecommunications

U S WEST: Meeting Customer Demand by Increasing Work Force Productivity with DCE and Encina

By Pamela Selker Allesi, *Corporate Marketing Specialist, Transarc Corp.*

DCE APPLICATION:
Work Force Forecasting System

BUSINESS BENEFITS:
Maximizes available resources, resulting in better service to U S WEST customers.

TECHNOLOGY:
DCE and Encina. Hewlett-Packard clients and servers.

U S WEST Communications, headquartered in Denver, Colorado, provides local and long distance communications to more than 25 million customers in 14 western and midwestern states, totaling over 14 million home and business telephone lines. With such a large and diverse service base, U S WEST needed to streamline its work force scheduling process to better meet customer demand.

To accomplish this goal, U S WEST undertook the development of Forecaster, a management system that allows the company to "forecast" its work force requirements and thereby be more responsive to its customers. With DCE and Encina as the underlying infrastructure, Forecaster equips U S WEST with a well-organized, efficient service staff to assist with whatever its customers' service needs may be.

As a service provider in the telecommunications industry, U S WEST must be able to activate and organize services for its customers quickly and efficiently. Recently, the company realized that in order to meet increasing customer demand, it needed to augment its existing mainframe applications with more flexible and cost-efficient systems.

U S WEST chose DCE as the infrastructure for building its new systems. For the Forecaster project, one of its first DCE-based projects, U S WEST identified Encina as a tool powerful and flexible enough to handle the demands of its new forecasting system.

U S WEST employs more than 61,000 people in more than 3,000 locations, many of whom are involved in the maintenance of its communications lines. In the past, the company had no formal way to estimate work schedules. The primary benefit of Forecaster is that it uses historical data from repair and installation service requests and math models to generate forecasts for U S WEST's work schedules (or "tours"). Once tours are generated, Forecaster then feeds downline systems, which, in turn, manage company resources by scheduling staff to handle service projects, such as repairing and installing telephones and telephone lines.

Currently, Forecaster predicts tours up to 13 weeks in advance; however, at the next release, Forecaster will predict tours up to two years in advance, allowing U S WEST to predict its work force needs for an extended period of time. This cost-control mechanism ultimately benefits U S WEST's customers by ensuring that a sufficient number of technicians will be on schedule and available to answer anticipated customer service requests for any given time frame within a two-year period.

For U S WEST's Forecaster project, DCE delivers a common foundation of communication and resource-sharing services for the development of secure, distributed applications. Included in the package is support for communication, security, naming, timing, and many other basic distributed computing functions, resulting in an integrated set of services for commercial-quality client/server computing.

The multi-threading capabilities of DCE allow the Forecaster system to perform many different operations concurrently. Threads offer excellent performance on uni-processor hardware, and they provide even better performance on multi-processor platforms. The threading services help Forecaster to divide the workload and conquer the tasks in a more efficient and concurrent manner.

Once the DCE-based infrastructure was in place, the company turned to Encina, a value-

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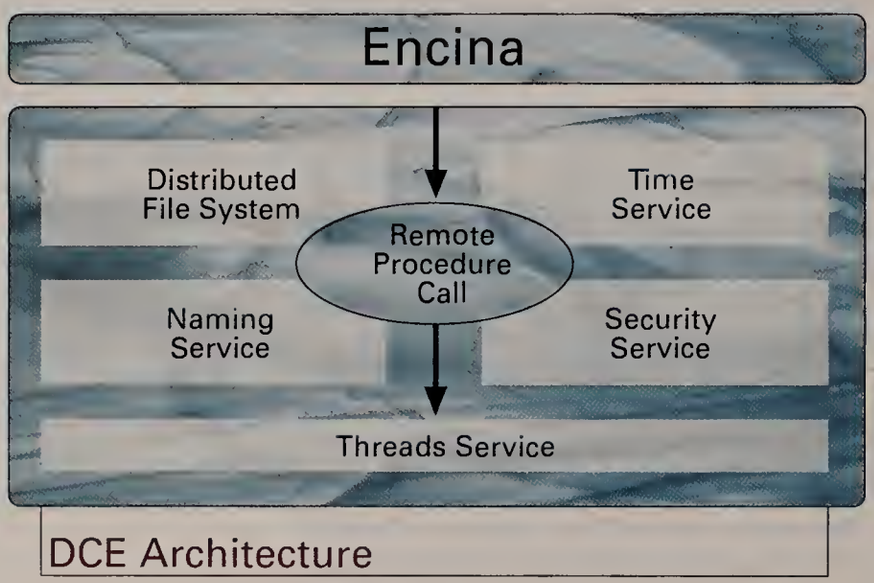
U S WEST continued

added product based on DCE, for the business-critical functionality required by Forecaster and not delivered by the core DCE services. In particular, U S WEST utilized the Encina Monitor, which promotes a scalable application architecture. Encina's modular architecture better positions the Forecaster application to grow and evolve. More importantly, the Encina Monitor shields U S WEST from the complexities of distributed computing, making it easier for the company to be responsive to its users.



DCE Architecture

Another benefit of the Encina Monitor is its ability to automatically detect and correct potential failures in the application execution infrastructure itself. For example, if U S WEST's application server crashes, all activity in the system could become stalled while waiting for the server to be restarted. The Encina Monitor extends DCE's capabilities in this area by providing an automated monitoring and restart function. The Encina Monitor keeps track of all application server and Monitor processes that should be running on each machine in an Encina Monitor cell. The Monitor will attempt to restart any failed process and will inform the operator console if unsuccessful.

One of the requirements U S WEST had for Forecaster was to ensure its data and business-function security. Encina inherits the extensive security mechanisms of the underlying DCE, with both clients and servers verifying the identities and privileges of participants in a transaction. Encina provides additional security mechanisms, including automated authorization checking and facilities to allow the construction of audit trail records. With these capabilities, U S WEST is confident that its data will be secure with Encina.

The Forecaster project has been in production for over a year. For U S WEST, one of the key advantages of the client/server environment is that applications can be accessed from many different locations in a diverse geographical area with a click of a mouse button.

For example, Forecaster is used by clients located throughout the U S WEST territory in Seattle, Washington; Salt Lake City, Utah; Plymouth, Minnesota; Denver, Colorado; Albuquerque, New Mexico; and Boise, Idaho. The server, an HP 9000/T500, is located in Omaha, Nebraska. U S WEST plans to include new functionality in future Forecaster releases, such as more multi-threading capabilities to further improve performance.

In summary, the combination of DCE and Encina provides U S WEST with a comprehensive collection of tools for developing, executing, and managing large-scale client/server systems. Forecaster is a scalable, business-critical information system that supports the company's rapidly changing and demanding business goals. For U S WEST, this means better manageability of a large number of work schedules. For U S WEST customers, it simply means better service. ■

Manufacturing

Corning: Using OpenVMS DCE to Implement a Standard Multivendor Data Server for Dedicated Process Control Systems

By **Donald F. Miller**, *Sr. Project Engineer, Corning Inc.*

DCE APPLICATION:
Provides high reliability, high performance, transparent, multi-vendor data server for process control systems.

BUSINESS BENEFITS:
Provides standardized heterogeneous communications services to a wide variety of hardware platforms.

TECHNOLOGY:
DCE for Open VMS, DCE for Digital UNIX, Windows and Windows NT clients, Corning's SDServer

Corning Inc. is one of the most respected manufacturers in America, with products ranging from consumer cookware to fiber optics. Like most companies in the process control industry, Corning is continually looking for better hardware and software solutions to meet its dedicated real-time control system needs.

In the past two years, Corning's process control organization has undertaken a major initiative to achieve vendor-independence through establishment of an open, standards-compliant, "plug and play" computing environment. This is a significant challenge. While Corning seeks to take advantage of state-of-the-art multi-platform data integration, distributed computing networking, and graphical user interfaces, these enhancements need to be incorporated into its operations without interrupting its mission-critical legacy process control systems.

Through a careful and innovative technology implementation, Corning has met and exceeded these requirements with Digital's DCE. DCE enabled Corning to establish a Standard Data Server (SDS) that allows users of multiple applications running on different vendor platforms to access crucial process control information quickly and easily. By shielding users from data format and networking idiosyncrasies, DCE provides complete transparency so that all data is accessible from OpenVMS, UNIX and PC workstations.

Recently, Corning's SDS OpenVMS system was ported to a Digital UNIX system seamlessly, without code changes. DCE will also allow Corning to scale its SDS solution to add additional servers as use of the system expands. But best of all, SDS has been introduced without sacrificing legacy process control system performance — crucial to maintaining Corning's competitive position.

"In effect, DCE extends the well-known VMS cluster concept to platforms by a large number of vendors," said Donald F. Miller, Senior Project Engineer, Corning, Inc. "DCE on OpenVMS is one of the best kept secrets in the industry. For open, scalable processing power, it's unbeatable."

> *"DCE was the only software that came close to meeting our needs. Its transparent multivendor networking capabilities have allowed us to meet and exceed our goals for vendor-independent, multi-platform data-sharing."*
> — Donald F. Miller

Corning is a worldwide organization with $4 billion in annual sales and 39,000 employees. It supplies more than 60,000 different products to more than 40,000 customer firms and millions of individual customers. These include information display, opto-electronic, laboratory service, and Corning's familiar line of consumer products.

Reevaluates architecture

Historically, Corning has depended on single-vendor solutions to address its process control needs, including Digital VAXeln systems. In order to take advantage of powerful, new client/server processor technologies such as Digital's Alpha family, Corning made a strategic decision to reevaluate its entire process control architecture. Its goals were twofold — to reduce internal appli-

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Corning continued

cation development costs by taking greater advantage of third-party software, and to achieve greater hardware vendor independence.

Early in the evaluation process, it became clear that a crucial component of Corning's "plug and play" environment would be its communications architecture. The optimal solution would have to be commercially available and highly standards-compliant, capable of bridging a diverse mixture of hardware and software. In addition, it would have to support existing applications without loss of functionality. This was a tall order.

"We had primarily used DECnet for task-to-task communications to link dedicated process control systems with graphical user interface or mainframe database systems," reports Miller. "While DECnet is a very reliable transport, it did not provide the level of networking transparency we needed."

DCE's Remote Procedure Call (RPC) methodology hides all networking idiosyncrasies, so programs can be written and used as if all code is running on one machine, even if component procedures are actually executing on remote, multi-operating system nodes of a DCE network, called a DCE "cell." DCE also provides powerful "data marshaling," security and time-synchronization services, essential to enterprise-wide process control.

Fast prototyping for fast results

In 1993, development began on a prototype Standard Data Server (SDServer) that could provide process control data to client applications running in the DCE cell. Graphical user interface programmers — the initial users of the system — were consulted to establish data flow requirements, which were defined using DCE's Interface Definition Language (IDL).

"Since most programmers at Corning use the C language, we found the transition to IDL to be very easy," Miller recounts. "Most of the changes we've seen since the original definition have been due largely to our users' expanded realization of what we can provide.

"In designing the server, we used a sample provided in the DCE for OpenVMS kit as a starting point. That allowed us to concentrate almost entirely on the coding of our actual functions," Miller reports.

Making the move — software portability

The OpenVMS SDServer was later ported to a UNIX server and Windows and Windows NT clients. "We were pleasantly surprised when we discovered mid-way through our project that we were able to successfully port all of our code without any changes to a Digital UNIX system," Miller adds.

The pivotal objective of the SDServer project was the need to integrate with Corning's legacy process control systems. "We were very concerned with the possible impact of the SDServer on the production system performance," Miller remembers. These concerns were quickly put to rest. There was virtually no impact on legacy system throughput.

Making waves with DCE

Today, SDServers support an optical waveguides and a pressware application. Expanded DCE-based solutions are right around the corner, including deployment of SDServers in Corning's video display products area. Using SDServer to support motion controller manipulation and mathematical modeling is also under consideration.

"DCE can play a significant role in our industry. And it can do so without interfering with the functions of mission-critical process control systems," Miller concludes. "DCE has met all of our requirements for a world-class, multivendor communications architecture." ■

Manufacturing

Caterpillar: Building a Foundation With DCE

By Greta Myers, *DCE Customer Partnership Program Manager, IBM Corp., and*
Jill Bartel, *Technical Writer, Sykes Enterprises*

DCE APPLICATION:
Support of world-wide commercial, engineering and manufacturing endeavors.

BUSINESS BENEFITS:
Ability to support commercial, engineering and manufacturing in three major datacenters around the world, supporting 60,000 users in all time zones, quickly and reliably.

TECHNOLOGY:
System/390, MVS OpenEdition, MVS/ESA DCE, AIX/6000 DCE, Entera

How does a large manufacturing corporation, operating in a global market, reduce the expense and complexity of managing information resources on non-integrated, heterogeneous computing platforms? By installing IBM's Multiple Virtual Storage/Enterprise Systems Architecture (MVS/ESA) DCE, enabling the corporation to leverage a very large System/390 processing base into the "open" world.

Over the years, Caterpillar Inc., the world's largest manufacturer of earth-moving equipment, has accumulated an array of processing platforms to support its commercial, engineering, and manufacturing applications. These platforms include offerings from Microsoft Corp., Digital Equipment Corp., Hewlett-Packard and IBM. However, as information technology has moved from a computer-centric environment to a network-centric environment, Caterpillar had to find ways to take advantage of its information technology investments.

Caterpillar has a very large installed System/390 processing base to support data processing worldwide. IBM's announcement of its MVS OpenEdition affirmed Caterpillar's commitment to a three-tiered application architecture.

Caterpillar felt that MVS OpenEdition, with its DCE compliance, would be the solution that would allow its Information Technology (IT) architecture to support corporate business goals. "We wanted to prove that the many disparate installed operating systems could operate together and potentially share data and applications in the evolving 'open global market'," says Peter Barclay, Manager of Client/Server Services.

Four years ago, Caterpillar started evaluating distributed computing and client/server. In order to match their organizational changes, they wanted to move from a mainframe-based structure to one that was client/server-based.

"We didn't want to be leading edge," Barclay continues. "We wanted an evolution, rather than a revolution, and knew that this transition would require the mainframe and client/server structures to coexist."

Specifically, Caterpillar's computing environment has 60 percent or more of its data on the mainframe in the Information Management System (IMS). Their IT organization supports approximately 60,000 users worldwide, roughly a third of whom are external to Caterpillar's corporate boundaries (suppliers, dealers and customers). Clearly, the proper solution is needed to support these users' evolution to network-centric computing, while at the same time protecting their investment in millions of lines of existing COBOL code.

> "MVS OpenEdition and its DCE feature will provide transparent access to the vast wealth of information stored within the System/390s in Caterpillar's global corporation."
> — Peter Barclay, Manager of Client/Server Services

Three years ago, Caterpillar organized a team to determine what its open systems architecture would look like. With design assistance from Wayne Zimmer, an IBM

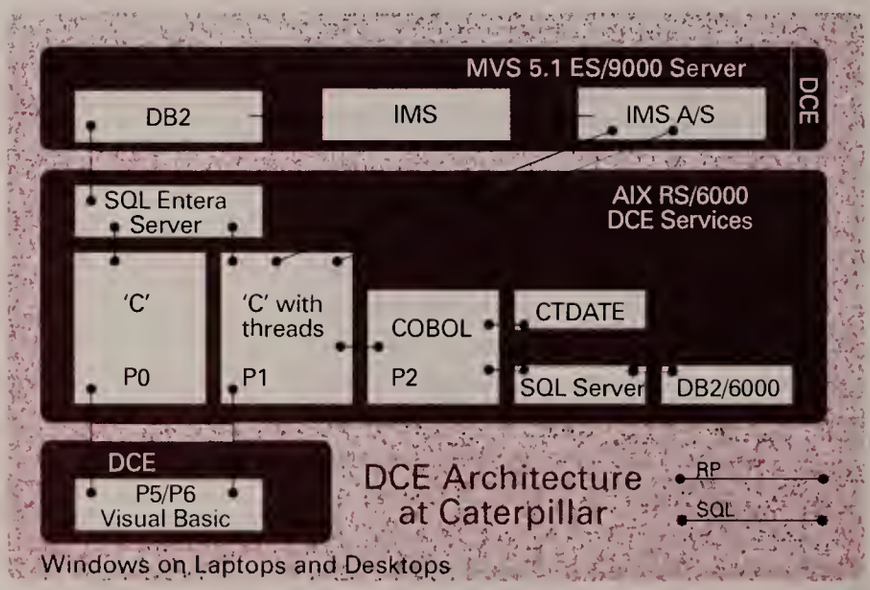
Manufacturing

Caterpillar continued

client consultant, the team assembled a recommended architecture guide for Caterpillar. The architecture defines the technology and industry standards that will enable Caterpillar to leverage the benefits of open systems. MVS OpenEdition is one of the products that allows Caterpillar to adhere to the evolving industry standards that are becoming the base for client/server computing.

> "We are very pleased with this system's performance."
>
> — Peter Barclay
> Manager of
> Client/Server Services

Caterpillar is using a three-tiered application architecture and sees DCE as a critical element of their architecture. They began piloting DCE on platforms from IBM, Hewlett-Packard and Digital Equipment. MVS/ESA DCE was added to their DCE solution suite three months later.



Their first production application will support their Human Resources function, employing a three-tiered architecture, including MVS/ESA Version 5.1 with the IMS Application Server running on a 9021-982 and also on two 9021-900s. The MVS host functions as a server to other platforms, including Digital and HP-UX, and provides access to the legacy data which is running on the System/390 processors.

In addition to MVS/ESA DCE and AS/IMS, Caterpillar selected the Entera application development environment and family of development tools from Open Environment Corp. With the combination of Entera's third-party support and DCE development tools, Caterpillar was able to provide its application programmers with an easy-to-use toolkit that helped them focus fully on implementing the business logic of the Human Resources application.

The integration offered by DCE provides Caterpillar employees with seamless, distributed access to sensitive data about employee benefits. The users can not only get to more data, they can get to it faster.

By applying DCE technology, Caterpillar reduced development costs significantly and uses its information resources far more effectively. Caterpillar also gained flexibility to deploy applications across a diverse set of operating platforms and responds more quickly to the needs of its users. ■

Manufacturing

EDS: Meeting Global Computing Needs With DCE

By **David Fowler,** *V.P. Sales & Marketing, Gradient Technologies*

DCE APPLICATION:
Worldwide standards-based support for engineering, plant and office environments.

BUSINESS BENEFITS:
Ability to provide common services, orderly migration and infrastructure investment protection for a major manufacturing client.

TECHNOLOGY:
Various desktop platforms, including Windows and Windows NT, MVS and UNIX.

EDS is a leader in the global information services industry. The company's more than 80,000 employees specialize in applying a range of ideas and technologies to help business and government customers improve their economics, products, services and customer relationships in 40 countries worldwide.

Working with EDS, a manufacturing client defined its infrastructure goals for moving ahead with distributed client/server applications. These goals must be considered for every development project. The five main objectives are:

- Converge engineering, office and plant infrastructures
- Provide common services
- Provide a secure environment
- Provide a mechanism for orderly migration and upgrade of existing infrastructure
- Protect investment in infrastructure.

Development teams had traditionally been using several solutions for middleware. ONC RPC was one popular option but it lacked the security features required by the infrastructure objectives stated above. Additionally, it lacked wide vendor support since it was not driven by a standards body. Some teams were using proprietary solutions. Again, these could not meet the requirements outlined for common services, orderly migration or infrastructure investment protection.

Infrastructure engineer Paul Frisch and his team settled on DCE as the middleware solution of choice. It meets the need to span engineering, office and plant environments. Because it was developed and is driven by OSF, it has broad vendor support across multiple platforms. The DCE security mechanisms satisfy the need for a secure environment for distributed applications. Additionally, DCE offers comprehensive tools and services for administration. Another major concern for the client was finding solutions that were capable of meeting global computing requirements. The client's operations are worldwide and only DCE was found to be able to scale to meet global communications needs.

EDS has three major applications in production for its client using DCE. These production applications illustrate the use of DCE to span engineering, plant and office environments in deploying client/server applications.

The first is an order management system. This suite of applications is currently running in-house at the client's site but is slated to be rolled out to the client's distributors in the future. The initiative is used for various order management services, including volume forecast, product ordering, product location and delivery, and stock information. With this system, the client can completely track a product from order to delivery providing enhanced customer service and lower administrative costs. The application suite relies on distributed client/server database transactions and requires integration with existing mainframe legacy systems. Additionally, in the future it will require remote network access for the client's distributors.

The second project is a corporate planing system which is a suite of applications used in determining product production. This system serves several departments with varied needs. It is used by the Sales and Marketing department for production expectations, by the Production Plants in forecasting product output volumes and by the Allied Suppliers to fulfill component volume projections. Both of these projects are using Gradient's PC-DCE for the client portion on PCs

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EDS continued

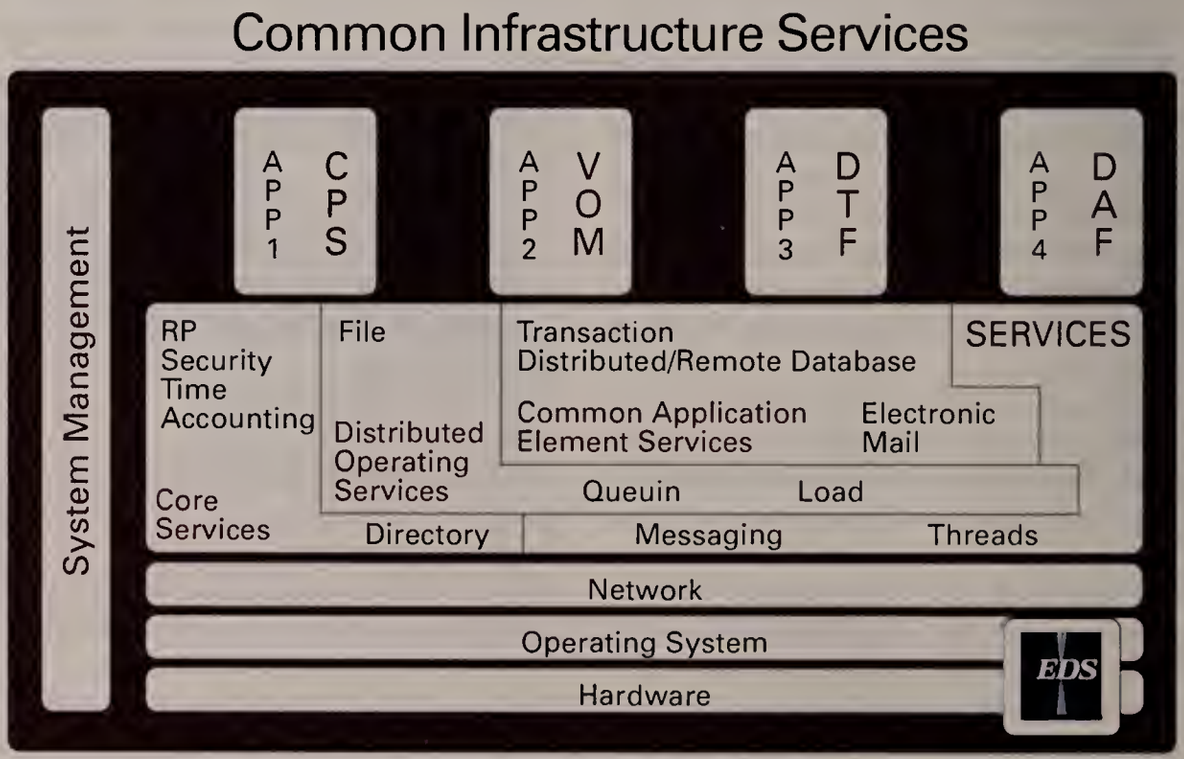
running Windows and Windows NT.

The third application is somewhat more unique. This is a distributed translation facility which automates the translation and transfer of geometric text and illustrated drawing files between different CAD packages. The application uses DCE on both an MVS mainframe and UNIX clients including remote sites. This application is critical in allowing the design engineers to share designs between different and disparate CAD packages, while providing secure data transmission to the mainframe.

All this hard work has not been without its challenges. Specifically, when EDS moved from development to production with an earlier version of DCE, administration was difficult. DCE 1.1 has addressed those concerns. Another area that can be troublesome is in debugging applications. Keeping in mind that this is a very complex environment, with distributed applications being by nature more intricate than stand-alone applications, this is an area where the broad vendor support has really helped.

The final hurdle is in educating the development teams about the notion of infrastructure and shared resources. DCE is a shared resource that many applications can take advantage of at the same time. And, developers must learn to use the infrastructure provided by Digital effectively.

To continue the progress, EDS recognizes the need to promote the technologies. A developer must be educated regarding DCE and should ask vendors for this solution. Since broad vendor support for DCE is now available, EDS believes it could have a strong influence on the industry direction. ■



Financial

An Interview with Jeff Chittenden, Vice President and Chief Architect, Corporate Technology, J.P. Morgan & Co.

By Jonathan Chinitz, *President, IntelliSoft Corp.*

Is DCE a strategic technology for J.P. Morgan?

We have a number of strategic business initiatives: real-time risk management, real-time information availability to traders and clients, efficient distribution of trades across our global network. Moving towards a synchronous distributed computing environment is our strategic direction and DCE is what we have chosen to support that direction. In actual fact, implementing DCE is so strategic that it is on the annual list of projects monitored by the chairman of the board.

Why did you choose DCE over other architectures?

We believed that it would support a heterogeneous computing environment, because of strong support from such a broad range of vendors, like Digital Equipment, Gradient, Hewlett-Packard, IBM, Open Horizon, Tandem and Transarc. We believe very strongly in following open standards as much as they exist, and DCE is an established standard.

Security is of paramount importance to us and we determined that DCE was the best current alternative to satisfy the security requirements ubiquitously across the firm. Especially as we start to make our processes more synchronous with more information available in the network, we need to control access to that information in a very secure fashion. The promise of single sign-on, a single security environment and a global filesystem, is a tremendous business driver. DCE supplied these functions as a standard feature, rather than something that we needed to build into applications ourselves. It was very important for us that our vendors viewed DCE in the same light. DCE is a strategic technology in their interoperability plans so it was a natural choice for us.

We also thought that the remote procedure call (RPC) paradigm fit well with our existing programming model. We don't think that it is a major retraining effort to get our programmers comfortable with using DCE RPC.

What are the deployment plans for DCE at J.P. Morgan?

We have a business commitment to have DCE working globally, in Asia, Europe and the United States, by the end of Q2 1996. By year-end 1996, we plan to have over a thousand nodes running DCE.

We are using DCE in a couple of ways. First, to build infrastructure software, like messaging. The infrastructure project is one that will bind the whole firm together. It will dictate how transactions flow within J.P. Morgan. Second, we're using it as part of an application paradigm for our most mission-critical business applications. DCE is the enabling technology for the reengineering of our firm. We're trying to reengineer the firm with global people processes, supported by global computer processes, accessible to anyone in the firm anywhere we do business. We don't see DCE as just another technology for technology's sake. We see it as enabling us to redesign the architecture of our business to take us into the next century.

Financial

An Interview with Jeff Chittenden continued

Do you see other companies in the financial industry that are following the same trend?

Yes — both securities firms and commercial banks. In the financial services arena, security and reliability are absolutely critical to the way we do business — data processing is the factory of a financial institution.

I think there is growing knowledge in the industry that you need standardization of middleware across an enterprise. As technologists, we understand the importance of making it simpler for programmers to develop distributed applications, using threads and RPCs. Location transparency itself enables us not just to relocate things around the firm, it allows us to talk about continuous operations throughout the firm. We have thought through the role that DCE is going to play to a point where we believe it is going to fundamentally change the way we think about computing.

Objects are on everybody's mind these days. Does DCE have a role in distributed object computing at J.P. Morgan?

Before looking at objects, I would look at transactions. One of the important things for us is a traceable mapping of business transactions to computer transactions. Another is an execution environment that guarantees security and recoverability. A distributed transaction processing (TP) monitor, running on top of DCE and interoperating with XA-compliant databases, gives us those things and is therefore an important part of our architecture. If we were to implement a distributed object environment ignoring this infrastructure, there would be a tremendous amount of complexity in the infrastructure that our developers would need to build themselves and we would probably be delayed for many years, because we could not guarantee reliable distributed transactions or enough security.

What we are trying to do is abstract these functions away from application programmers to increase their productivity. It is important to us and it is a strong message that we are communicating to our vendors that object request brokers (ORBs) must be layered on top of DCE, preferably on top of a TP monitor, so that we can incorporate security and transactional semantics into objects and we don't have to wait two or three years or maybe even longer for that to make it into ORB technology. Why should the Object Management Group and the ORB vendors be spending money developing security and other functionality that is already available in DCE today? It certainly complicates interoperability between the current procedural paradigm and the object one. It is not in J.P. Morgan's interest to consider objects and ORBs that are not layered on top of DCE.

The computing environment at the firm must be quite diverse. Can DCE address this environment?

With the combination of software from some of the niche vendors and the basic DCE from our core vendors, we think we can connect most of our legacy environment using DCE. That means Unix, Mac clients, Windows clients, our preferred databases, and our MVS mainframes. We see DCE as the natural paradigm for the new applications we're designing. Where DCE cannot provide an immediate solution, we are still going to abstract the legacy functionality away through a gateway. Hopefully we will move toward a consistent API for programmers to use in accessing any other service in the network.

JEFF CHITTENDEN

As we see it, the issues of network reliability and latency are the ones we must address to make distributed processing a reality. It's not bandwidth. Bandwidth just takes dollars. Besides, distributed processing should reduce our network costs, because we will replace very large amounts of data replication with reliable messaging. J.P. Morgan already has one of the most advanced global networks so we are not intimidated by the idea of "wide area DCE." We are only slightly concerned about getting adequate support from our vendors in all these locations, and where we can't get it we'll support the systems ourselves.

Q A

What do you need from the vendors in the next 12-18 months to make this happen?

Support — from all the vendors. There are a few who have not yet fully embraced DCE. Long range, we would much prefer that they do so. We would feel more comfortable if we could get Microsoft to provide a native DCE port that we could purchase directly from them.

We'd also like our vendors to take an enterprise view without feeling that they have to dominate the enterprise. Our view is that all vendors are just players in the enterprise. We want open standards to dominate the enterprise. Middleware will help set those standards. If we can demand DCE compliance as the gating factor for vendor platforms, then, in a very proactive way, we can control the systems environment in the enterprise.

"We'd also like our vendors to take an enterprise view without feeling that they have to dominate the enterprise. Our view is that all vendors are just players in the enterprise. We want open standards to dominate the enterprise."

Q A

What are the key challenges that J.P. Morgan faces in trying to migrate the firm from departmental style to enterprise wide computing?

The natural evolution of the business is driving this change, so there's no difficulty in making a clear and convincing business case. I think that the challenge lies in convincing people that this is not difficult. It is not easy, but it is a lot easier than people think. One of the bad raps that DCE gets in the press is that it is too complex. In fact what DCE is doing is centralizing complexity, exposing it to a smaller group of people. At J.P. Morgan, we have created a group of experts that will implement and manage the DCE environment. Then we have a library group that will supply the convenience routines to make DCE easier for the business programmers. In the end, DCE is going to allow us to run our firm the way we want to run it. ■

"We have thought through the role that DCE is going to play to a point where we believe it is going to fundamentally change the way we think about computing."

Financial

Caja Castilla La Mancha: Open Systems Success with DCE-based CICS for HP 9000

By **Lily Lu**, *Product Manager, Distributed OLTP, and*
Patricia McHugh, *Product Manager, Hewlett-Packard Co.*

DCE APPLICATION:
CICS/9000 (on top of DCE/9000) application developed to expand banking business to provide other services such as insurance.

BUSINESS BENEFITS:
Leverages CICS application development skills from mainframe, providing reliability and transaction integrity across databases on the HP server and IBM mainframe. Allows mainframe workload to be shifted to more cost-effective UNIX servers.

TECHNOLOGY:
HP 9000 I50 server, CICS for HP9000, Encina PPC Gateway, IBM 3090, PCs.

Caja Castilla La Mancha (CCM), a retail bank in Spain, wanted to expand its traditional business and provide insurance as a new service through its new subsidiary, Castima. After a careful evaluation of upgrade costs and several approaches to open systems, CCM decided to use HP's CICS for HP 9000, a DCE-based technology, for developing the new insurance application on an HP 9000 Model I50 server (see illustration).

HP's CICS/9000 uses DCE/9000 for basic distributed computing services and Encina/9000, another DCE-based technology, for transactional core OLTP services, such as logging, locking and recovery control. With CICS/9000's peer-to-peer gateway (PPC) and two-phase commit, CCM is maintaining full transactional robustness and interoperability with CICS on the three existing mainframes that handle transactions and the bank's core business functions.

Decision to "go open"

CCM handled its account transactions and business functions with three IBM mainframes connected to approximately 1,500 terminals and PCs at the branches. As a result, the bank needed to preserve its legacy investment in the mainframes and branch terminals by extending their functionality.

By offloading the insurance application to the new HP open systems platform, which is linked to the legacy environment, the bank gained additional computing power without consuming mainframe resources. This new system also had to synchronize closely with CICS on the mainframe because, first, it was accessed through the mainframe by terminals and PCs at each branch location, and second, essential customer data had to be gathered from the mainframe to complete transactions in the new application.

Since the new insurance application also required updating customer data on the 3090, strong CICS communication between the 3090 and the new system was key to achieving successful interoperability. Accomplishing this interoperability permitted the offloading of an application from the mainframe DB2 environment to an open system, while enabling the creation of a new business strategy for the bank.

Important to future flexibility in addressing companywide interoperability, and as an alternative to expensive mainframe upgrades, CCM needed to gain a benchmark in experience from which to evaluate the offloading of other mainframe applications onto different servers.

Driven by this need to implement open systems, CCM wanted the ability to develop and deploy applications that seamlessly communicate with its mainframes and give branches faster access to data located on either the new servers or the mainframe.

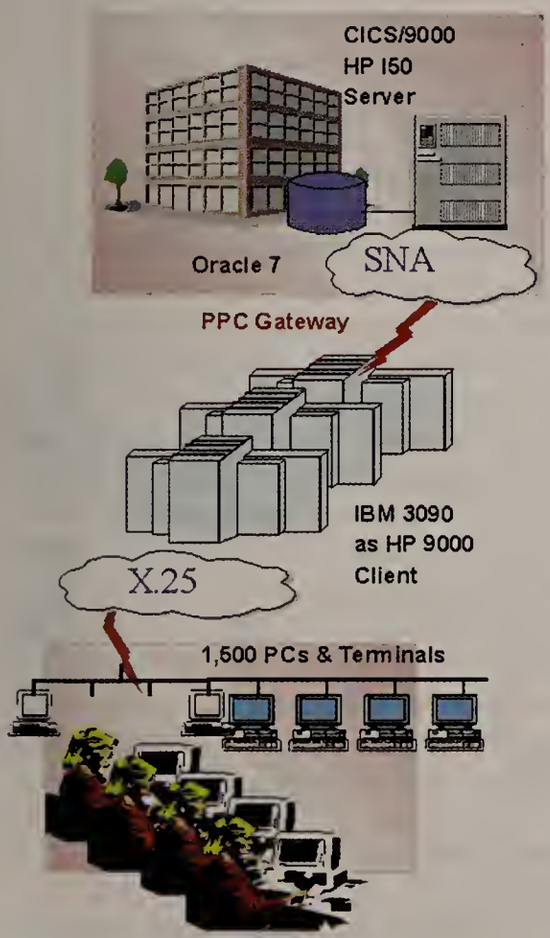
Business and technological advantages

The CICS/9000 project for CCM successfully enabled codes to be written for application programs on both the open server and mainframe in order to obtain transaction information from each other via calls over communication protocol LU6.2.

The new insurance application was on top of CICS/9000, using an HP 9000 server next to the 3090 mainframe using a token ring connection. The application was created in three months

using UNIX, Oracle and CICS for HP 9000 with the PPC Gateway.

The project also addressed a key technological challenge of connecting the branch terminals and PCs to the mainframe via SNA over X.25. The branches do not make direct requests on the HP 9000 server; rather, every transaction generated in a branch comes to the 3090. When the 3090 realizes that a transaction is not for it, the system invokes a CICS facility called transaction routing and sends the transaction to the HP 9000 server. Upon receipt of the transaction, the server invokes another CICS facility called function shipping to recall information from the 3090's database, since part of the information the server needed is on the 3090. In essence, the mainframe acts as a file and communications server to the HP 9000, which serves as both a back-end datasource and application server.



To expedite insurance sales, new insurance transaction definitions are added to the existing customer portfolios in the bank's 500 branches. For example, when a customer goes to any branch requesting life insurance, bank employees select one of the new insurance transactions. Using Distributed Transaction Processing (DTP), between mainframe CICS in MVS and CICS in HP 9000, the transaction updates the customer information in DB2 on the mainframe, and the insurance policy records in Oracle on the HP 9000. Fundamental to the success of this transaction process is HP's ability to provide the two-phase commit synchronization of updates between the mainframe and the HP 9000 via CICS/9000 and the PPC Gateway.

With the new open system infrastructure designed by HP's professional services consultants, the bank provides new UNIX service applications at its branches for customers quickly. It also eliminates costly upgrades to and maintenance on its fully utilized mainframes. It allows for full interoperability with the mainframes by preserving the legacy investment and increasing the number of users.

In production since December 1994, the new DCE-based system has more than 500 users carrying out transactions for approximately 100 policies a day.

With this new application, CCM has a successful open systems implementation under its belt. While being able to reduce the complexity of application development and deployment, the bank has realized the benefits of improved flexibility and quicker responsiveness to the changing business market. ■

Government

An Interview with Major General Campbell, Program Executive Officer, Command, Control, and Communications Systems, U.S. Army

By Kathryn DeNitto, *DCE Technology Manager, Open Software Foundation*

Why did the U.S. Army choose DCE?

The Army has a requirement to digitize the battlefield. In our current parlance, digitizing the battlefield means providing our war fighters modern computer technology (hardware and software) and communication systems. Our intent is to provide commanders, their staffs and individual soldiers with systems they need to operate inside the enemy commander's decision cycle.

Historically, we put together systems that were vertical in nature — some called them "Stove Pipes" — which addressed a specific function like intelligence or operations or fire support or resource management. But a commander needs to integrate data from multiple heterogeneous systems so that he can see a common picture of the battlefield — see his disposition and the enemy's disposition, see the status of his resources, see the status of his fire support systems — and orchestrate and manage all of those war fighting systems, using the data that's available from all of his command and control systems. He has a requirement for tools that allow him to ask unanticipated questions and to integrate data in real time so he can make intuitive judgments on how to deploy and employ his forces.

We have made a commitment to use commercial technology (both hardware and software). We've made a commitment to build an architecture that will provide battle commanders and soldiers with consistent tools that can be used across the full spectrum of war. And we've made a commitment to use products that are mainstream — mainstream within the technology that the commercial industry is employing — so that we can leverage the investment that commercial industry has made.

How did the activities in the commercial sector influence your decision?

In trying to build a system that integrates data from multiple sources, we looked at what industry was doing and determined that the client/server architecture being built by industry was consistent with the Army's needs on the battlefield. To provide systems that would allow a commander to ask for and receive data in near real-time, we chose to use DCE products as part of our architecture (as part of our middleware). We looked for tools commanders could use now — tools that would grow and evolve in the future as industry makes advances in their product lines — tools that would allow users to employ a GUI to point and click on an icon and activate client/server software to generate the desired purpose.

We have determined through a study of commercial products that the DCE technology provides us the tools we need for the commanders and their staffs to integrate and correlate information that is retrieved from heterogeneous systems on the battlefield.

And as we build our Army battle command architecture for the future, it is our intent to use DCE as part of our infrastructure to provide the tool kit that the commanders can use anywhere on battlefield to access information from a full range of systems extending from servers running on high capacity workstations in command centers through the 486 and the Pentium-based laptops that are used by individual soldiers. That's the context and rationale for choosing DCE.

Government procurements demand vendor neutrality. How does DCE fit the bill?

Yes, vendor neutrality is very important to us. We will build systems in the future based on open sys-

tems architecture concepts. We will go out on competitive solicitations to industry and we will procure industry products that meet the open systems architecture guidelines. Then we'll insert this technology into fielded systems.

It's important to us as we implement DCE that we have vendor neutral software that can be implemented across the full range of workstations and PCs that will be deployed on the battle field. The Army systems and those deployed by our sister services must be able to interoperate in a joint and combined environment, because that's how we'll conduct military operations in the future.

"The DCE product line ... will be integrated not just within the Army but within all of the global command and control systems that are being sponsored by the DOD."

Explain how DCE meets your interoperability and scalability needs.

DCE provides us with the capability to interoperate across heterogeneous platforms and to operate with platforms that vary in their capacity.

The Army may choose to buy systems from one vendor, the Navy or Air Force from another, and within a service there may be systems that are provided by multiple vendors. We must have the capability to interoperate across all of the systems, whether they are new systems to be procured in the future or whether they are legacy systems that are part of the suite of command and control systems that are used by our war fighters.

It's important that that same software can be used across a range of platforms that extend from laptop class devices operated by individual soldiers or embedded in weapons platforms, to the high performance RISC processors that we are employing in our operation centers. We use the scalability features of DCE to achieve commonality across platforms. Its client/server features allow us to distribute processes across a network in a manner consistent with various hardware environments.

How large is the scope of the DCE project?

DCE is part of the architecture that we'll be using in each and every one of our command and control systems worldwide.

Is this a combined Department of Defense (DOD) and Army commitment?

We're working with the Defense Information Systems Agency (DISA), and the other services on a "common operating environment" (common hardware, common software) — an architectural infrastructure based on industry standards which will be common on systems used by the Army and other services as well.

The war we fought in Desert Storm was characterized as joint warfare and coalition warfare. We will probably never go to war again as an individual army. The whole concept, the whole doctrine, is joint warfare, and, in order to accommodate interoperability horizontally across forces as well as vertically within the forces, we have to have a common environment and a common infrastructure.

Government

Interview with Major General Campbell continued

In building the common operating environment, the Army is in lockstep with the Defense Department and is providing software modules for DOD's common operating environment.

A key feature that has been chosen to be part of that common operating environment is the DCE product line, which will be integrated not just within the Army but within all of the global command and control systems that are being sponsored by the DOD and implemented by DISA.

How would the DCE system aid a soldier in the field?

From an operational perspective, it is really important that deployed soldiers have the ability to access the computing power and databases that reside in local or remote workstations. DCE provides us with the capability to allow an individual soldier with a workstation or low-end device embedded within his or her weapon platform to access the databases that reside on the higher-end servers and RISC processors. It permits commanders and staffs to integrate functions horizontally.

Would you describe a specific application?

Let me give you an example of how we would use DCE across different systems in a Tactical Operations Center. The Advanced Field Artillery Tactical Data System develops the fire support plan. As the fire support planner is doing his job, he requires access to information on the logistics support posture. So using DCE's client/server environment, he would have access to resource information on such things as fuel, ammunition and fuses which is available in the Combat Service Support Control System. Conversely, the logistician operating the Combat Service Support Control System needs access to what the fire support planner is doing so he can concurrently develop his logistic support plan. DCE enables those planners to synchronize their activities and to operate on a shorter cycle time because each has access to the other's data and plans. That access is achieved by way of the client/server architecture that's provided by DCE.

How does the choice of DCE figure into your future plans?

In our decision to use DCE, we have made the assumption that as DCE evolves it will remain backwards compatible with our legacy systems — and as DCE expands we will import new capabilities from the commercial sector.

It is vitally important that the Army stay in synch with the commercial world, and as industry evolves into object-oriented technology, the Army will follow industry. We are counting on DCE to serve as the baseline for the implementation of object-oriented technology within our war fighting systems. And, we are counting on the DCE community to bring those tools to us so that we can implement object-oriented technology without having to go through a major retrofit of our systems, or without having to go through a redo of our investment strategy. I expect to continue using DCE as long as it remains a mainstream commercial standard that provides responsive support to our war fighters. We'll be active participants with standards groups to help make the future versions of DCE even better than today's. ■

Utilities

Southern California Edison: An Enterprise Approach to Single Sign-on

By Michelle Rockler, *Manager, Corporate Marketing, Open Horizon, and*
John Dohm, *Manager, Distributed Computing, Deloitte & Touche LLP*

DCE APPLICATION:
Single sign-on for SCE business applications ultimately leading to enterprise-wide network-based security.

BUSINESS BENEFITS:
Provides single image log-in, centralized authorization and simplified administration for usability, security and scalability. Sensitive information is also protected using DCE encryption services.

TECHNOLOGY:
IBM RS/6000 AIX v.4.1.3 and v.3.2.5, PC DCE 1.0.2a, DCE base services 1.1, Sybase System 10, Sybase Gateway, Gupta Gateway, Connection for Sybase, DACM, Deloitte & Touche DCE Toolkits, Novell NetWare (future), IBM MVS (future).

Southern California Edison (SCE) is one of the largest utilities in the nation, serving 3 million customers in more than 600 cities across thousands of square miles, with 12,000 geographically dispersed employees.

Recently, regulatory changes have been proposed, affecting the entire landscape of the utility industry. Intensified competition is creating new business demands, requiring more flexible computing platforms. In response to these external pressures, SCE has started to transform its approach of information technology (IT) to become a formidable competitor in this new business environment. This transformation includes aggressively implementing client/server technology throughout its numerous sites as well as changing the role of the IT organization from a provider of administrative systems to a provider of infrastructure supporting the core business.

Business and IT goals

To stay ahead of competition, the company's goals included streamlining operations and improving customer service. This required that the IT organization integrate existing communications and computing technology and extend the distributed computing enterprise.

The IT organization identified distributed security as important to both data integrity and application development efficiency. Client/server applications were developed using numerous languages and tools, and deployed on a variety of platforms. Each development effort involved the programming of a log-in mechanism and an access control mechanism. Security and systems management requirements included:

- Improved application development efficiency by creating consistent, manageable security and access control mechanisms
- Integrated purchased business applications
- Increased effectiveness of security administration staff
- Simplified client access to business applications
- Support levels of security dictated by business risk.

Given their focus on client/server developments as well as the security and systems management requirements, SCE implemented an architecture based on the DCE security services. A major part of the implementation required middleware that DCE-enabled the connections between clients and database servers. To meet these requirements, SCE selected a suite of products providing core DCE services, management tools, and some extended functions necessary for distributed computing.

The deciding factor for DCE addressed the need for distributed applications to transparently and securely connect to network-based resources — the most critical of which are relational database services. However, while many security solutions exist for simplified sign-on, few address secure connections for widely deployed products such as Oracle and Sybase. And only one, a standards-based product called Connection from Open Horizon that leverages DCE, offered SCE secure database access and mainframe-quality services with no application changes.

Pre-solution environment

SCE's distributed computing environment was a heterogeneous mixture consisting of 16,000 nodes across numerous sites and included the following components:

Utilities

SCE continued

- Macintosh, OS/2, Windows, and various Unix workstations
- IBM RS/6000 AIX and Sun SunOS/Solaris workstations and servers
- Novell file servers
- IBM MVS mainframe
- Sybase, Oracle, DB2 and VSAM and associated gateways
- PowerBuilder, Visual Basic, Smalltalk/Visual Works, OMNIS 7, Gupta SQLWindows, C/C++, 4D
- Various SQL query tools
- IP, SPX/IPX, IPX, AppleTalk and SNA.

SCE's client/server applications were a mixture of in-house developments and vendor packages. All applications had a unique log-in and access control mechanism, requiring support staff to perform redundant administration across multiple platforms as well as requiring end users to remember numerous user IDs and passwords.

In addition, the growing complexity of the distributed environment not only increased the workload of the support staff, but also impeded accessibility to systems resources — a primary reason for pursuing client/server technology in the first place — as end users experienced myriad log-in procedures. SCE required integration into a common security infrastructure that provided identification and authentication, authorization and access control, audit trails, security administration activities and administrative tools.

Post-solution environment — DCE

SCE IT staff quickly saw the value of providing common services across platforms as opposed to solving each business problem in a vacuum. One such service that quickly became the project focus was single sign-on (SSO). Although SSO seems easy to understand and to deploy, implementation is actually quite complex — particularly in light of the number of disparate systems, applications and network resources, each of which maintains a separate and unique security mechanism.

A review of the marketplace led SCE to select the OSF's DCE security services to provide the foundation for single sign-on. These security services provide for common:

- Identification and authentication (user IDs/passwords)
- Authorization/access control to resources
- Audit services
- Administration facilities.

The initial production implementation infrastructure, which also allowed single sign-on, centralized security administration and centralized access control, uses numerous products based on OSF DCE 1.0.3 technologies. This was accomplished through the use of the core DCE components from Gradient Technologies and IBM Corp., as well as IBM's DCE Security Server and Cell Directory Server, Dazel Corp.'s Distributed Access Control Manager (DACM), HaL's Cell Manager, and Connection from Open Horizon. Integration services were provided by the Distributed Computing Services practice of management consulting firm Deloitte & Touche LLP.

To assist the application developers in deploying the DCE-based infrastructure, SCE created a set of "client/server security toolkits." These toolkits consisted of a set of APIs to provide a simplified method for integrating applications into the new security architecture. Toolkits were developed for C, Visual Basic, PowerBuilder and Gupta SQLWindows.

Implementation

One large enterprise-wide client/server application suite is currently in production using the DCE security infrastructure. The changes required to "retrofit" the application for the infrastructure were minimal, taking less than a week to complete.

SCE is now completing the implementation of 2000 DCE-enabled Windows workstations and servers, with the goal of enabling a DCE-based security infrastructure for the entire enterprise by mid-1997. This will include more than 12,000 DCE nodes, including various flavors of Windows, Macintosh and OS/2. As more nodes are DCE-enabled and more client/server applications take advantage of the infrastructure, the utility will receive greater payback in productivity by users, programmers and administrators as well as enhanced security.

Single Sign-On (SSO) solution

Given that the majority of resources used by organizations are not architected to understand the identity of an authenticated user, SCE needed to identify a solution bridging the gap and providing comprehensive SSO. While DCE provides a secure infrastructure for SSO (based on Kerberos network authentication model), authentication to certain non-Kerberized resources requires additional software. For SCE, the Connection product from Open Horizon provided that additional SSO to certain non-Kerberized resources.

SSO support for clients with multiple connections to common database environments such as Sybase and Oracle is another challenging area. Typically, clients are configured with information as to the network address of each database, and users are required to enter a name and password to access each unique database system. This information is generally transmitted in clear text when the user is authenticated. By using the Connection product, a seamless log-in to all DCE-enabled databases is provided along with encryption services protecting critical data.

Connection's unique approach to SSO solves the challenge to IT organizations by mapping a network authenticated user to non-Kerberized resources such as databases and applications.

Conclusion — key success factors

Before beginning work, the DCE implementation team developed a project plan that focused on delivering value at regular time intervals. This strategy offered two benefits: The project became task-oriented and the organization periodically saw tangible benefits, assuring measurable progress.

The first task of the plan involved selling the organization on the value of a distributed computing infrastructure. Fortunately, most IT executives understood the risks associated with building distributed applications without supporting mechanisms and management tools.

The second task developed an enterprise vision and implementation plan to deliver distributed computing services. Done in several phases, the long term objective offered flexibility and scalability in the computing environment to meet changing business needs.

The implementation plan also took into account legacy systems and applications. In the client/server revolution, businesses continue to depend upon legacy systems which are critical in keeping the doors open. The migration plan chosen by SCE focused on providing specific business benefits that were matched with appropriate technology solutions. The project was segmented into three phases. Phase one included implementing DCE services for internally developed applications, phase two brings legacy systems into the fold, and the final phase adds DCE-based distributed services such as transaction processing monitors.

In addition to its security services, DCE also provides the utility with a common distributed programming and file system model, along with directory and time services. Given these DCE facilities, SCE is developing its business solutions without reinventing services typically offered by middleware. ■

On-line

LEXIS-NEXIS: Gaining Time-To-Market Edge With HP OODCE/9000

By **Lily Lu**, *Product Manager, Distributed OLTP, and*
Patricia McHugh, *Product Manager, Hewlett-Packard Company*

DCE APPLICATION:
Part of online information services. DCE-based application on UNIX servers to perform session administration for search requests from users.

BUSINESS BENEFITS:
Faster time-to-market for newer data services, flexibility and security.

TECHNOLOGY:
HP and Sun servers, HP DCE/9000, OODCE/9000, HP/UX, Solaris, MVS.

In the on-line information business, the ability to provide greater access to ever-increasing amounts of data is key to maintaining a competitive position in this rapidly growing, fast-changing marketplace. That is why LEXIS-NEXIS offers an extensive array of enhanced information retrieval, storage and document management products and services. The LEXIS-NEXIS service is one of the world's premier sources of on-line information, and offers legal, news, business and government information services.

In order to improve its competitive position in the market and meet its strategic goals, LEXIS-NEXIS strives to offer users more products and new, improved forms of access to the service's terabytes of data. But to satisfy this essential requirement, more user products needed to be released in a shorter period of time. For that reason, the company began moving segments of its on-line services from its nine MVS-based mainframe servers to a fully distributed heterogeneous open system. Open systems provide programmers with the tools and facilities necessary for greater flexibility and faster application development.

To provide a distribution infrastructure for the UNIX servers that access the mainframe databases to satisfy search and retrieval requests, LEXIS-NEXIS selected OSF's DCE from Hewlett-Packard. To maximize the advantages gained from DCE, the company chose HP's Object-Oriented DCE (OODCE/9000) to gain support for rapid, object-oriented C++ application development.

By using OODCE/9000, LEXIS-NEXIS was able to shorten the learning curve in developing DCE applications and to move the DCE programming interfaces — which exist at a very low level — to a higher level of abstraction. "We don't want to be DCE experts, we want to be DCE users," says Dave Skeen, a DCE project coordinator at LEXIS-NEXIS. "HP OODCE/9000 eliminates the need for us to deal directly with a lot of the DCE infrastructure." DCE-based applications offload processing currently done on mainframes, so that those systems can better handle increasing customer demand.

Need for faster application development

LEXIS-NEXIS is a division of Reed Elsevier Inc., part of the Reed Elsevier plc group. Based in Dayton, Ohio, the division employs 4,500 individuals worldwide with reported 1994 sales of $623 million. Its LEXIS-NEXIS on-line service received well over 6 million queries a month in 1994 with a total of nearly 75 million logged for the year. The system routinely accommodates more than 2,500 simultaneous users and searches through terabytes of data. In a typical month it serves 437,000 active subscribers.

The company's six-building campus in suburban Miami Township, Ohio, includes one of the world's largest data centers, containing nine MVS servers, fed by 15 front-end communications processors.

In looking to distributed systems, LEXIS-NEXIS was driven by the need to migrate its more frequently changed components to a platform that offered reduced application development time. In addition, its legacy applications were costly and time-consuming to modify. By implementing open systems, LEXIS-NEXIS was able to support its object-oriented C++ application development using HP OODCE/9000 and make productivity gains while reducing costs.

Advantages of HP OODCE/9000

In 1992, LEXIS-NEXIS began its move to a distributed heterogeneous system, comprised of HP-UX 9.0, Sun OS and Solaris. The systems communicate via EDDI and Ethernet LANs. Although LEXIS-NEXIS utilized both HP and Sun, the decision to find a distributed software solution required evaluation from a different set of criteria.

Before settling on HP OODCE/9000, LEXIS-NEXIS, which has legacy client/server programs written with Netwise RPC, considered Sun's ONC RPC and NIS, as well as message-passing using UNIX TCP/IP sockets. DCE was chosen for several reasons. First, remote procedure calls (RPC) are a more natural programming paradigm than message-based systems. When properly implemented, the remoteness or locality of the service is less obtrusive than in typical message-based approaches. Second, DCE is vendor-neutral and an industry standard, offering an integrated security service and a naming service for dynamic client-server binding.

LEXIS-NEXIS soon realized that any applications being built on Netwise or ONC RPC did not have integrated programming support for location-independent naming and security, or integrated multi-thread support. From an administrative standpoint, there was significant difficulty recreating what DCE offers in its namespace and registry. In using ONC, some of these capabilities came from NIS+, but not nearly all that LEXIS-NEXIS depends on from DCE today.

If a CORBA solution had been chosen, LEXIS-NEXIS realized that programmers had to work with a less mature and evolving infrastructure, without security and burdened with primitive support tools. Since LEXIS-NEXIS determined that OODCE/9000 provided complete coverage of the DCE APIs and a good mix of utility and framework classes, LEXIS-NEXIS used OODCE/9000 to help build core aspects of its distributed environment without the need to implement complex DCE infrastructure code.

Although LEXIS-NEXIS has in-house C++ experience, C++ utilizes a single process development metaphor and doesn't package well in a multi-process environment. Through its C++ mapping to DCE, OODCE/9000 solves this problem by providing an object-oriented distribution mechanism for DCE development. LEXIS-NEXIS customers were given a new Windows application, coded in C++, which communicates with server programs written in C++ on Unix platforms.

At this time, DCE applications are inherently multi-threaded and writing thread-safe code proved to be a challenge for programmers grappling with the issues raised by threads for the first time. However, OODCE/9000 addressed the problem of reconciling DCE exceptions with C++. In terms of error handling and exceptions, LEXIS-NEXIS found that OODCE/9000 provided a good error-handling framework through its definition of DCE error classes, its ability to recast DCE errors as C++ exceptions, and its protection of application code from CMA exceptions. In addition, LEXIS-NEXIS was satisfied with the way OODCE/9000 expressed RPC interfaces and with the way OODCE/9000 also supported explicit binding, which LEXIS-NEXIS desired for increased flexibility of client and server processes. The DCE application development for LEXIS-NEXIS was greatly simplified by using HP's OODCE/9000.

LEXIS-NEXIS has extended the capabilities of OODCE/9000 to provide performance and reliability enhancements for all servers built with the company's internally developed OODCE/9000 framework. This has resulted in significant cost avoidance and development enablement. For LEXIS-NEXIS, the promise of DCE held true. ■

Insurance

Tokio Marine & Fire: HP Designs Architecture for Disaster Recovery With DCE-based Solution

By Lily Lu, *Product Manager, Distributed OLTP, and*
Patricia McHugh, *Product Manager, Hewlett-Packard Company*

DCE APPLICATION:
Insurance business processing in a three-tiered client/server environment, ranging from contract inquiry and loss claims to sales support and accounting. Data and servers replicated.

BUSINESS BENEFITS:
Reliable, secure transaction processing, faster order processing and rapid recovery from 1995 Kobe earthquake.

TECHNOLOGY:
HP 9000 Servers (G/H/I Class), HP Encina/9000, HP DCE/9000, IBM 9021, Windows PCs.

An IT nightmare

Tokio Marine & Fire is the premier insurance company in Japan, whose mission-critical data, stored in mainframes, serves several branch offices in various Japanese regions. Its DCE-based disaster recovery system enabled Tokio Marine & Fire to emerge unscathed from the Kobe earthquake of early 1995.

Using Encina/9000, a transaction monitor on top of an underlying DCE/9000, the architecture was designed and implemented by Hewlett-Packard (HP) as an open distributed computing solution for Tokio Marine & Fire. HP also paid special attention to risk management and infrastructure development because of the importance of and concerns about the integrity, security and reliability of the large volumes of data for processing as well as the need for quick access to updated information.

"If we had still been using a vertical network, we could not have been able to tide over the earthquake," says Hajime Tamano, district sub-manager for Tokio Marine & Fire and project leader for the new system. "We are grateful to Hewlett-Packard for their quick support during the Kobe earthquake."

The solution: a recovery system

The recovery system that included a middleware design, using Encina/9000 and a redundant DCE cell, is located in Osaka, which is the least earthquake-prone region in Japan. The disaster recovery center, which has Encina, DCE Cell Directory Server and Security Service, backs up two terabytes of data from the Tokyo mainframe daily. The desktop computers, in a three-tiered client/server architecture, can switch over from one local server to the backup seamlessly.

Tokio Marine & Fire uses HP Encina/9000, a distributed transaction-processing monitor, which is based on the OSF's DCE, to ensure distributed transactional data integrity through its coordinating, scheduling, queuing and logging capabilities. Together with HP DCE/9000, Encina serves as the foundation for building the "middleware" on the HP 9000 Business Server that enables communication between the branch office desktop computers and the mainframe.

Benefits

By using this new open HP system, Tokio Marine & Fire has gained competitive advantage over other insurance companies by handling claims very quickly and efficiently. On-line response time has been reduced from 10 to 4.5 seconds, which improves worker productivity greatly. Transmission time has also been lowered from 7 to 0.8 seconds. With GUIs on the desk of every user, the 700-application menu scheme is simplified and better reorganized by business function.

Furthermore, the PCs can now run two applications in parallel. In short, the system is now remarkably easier to learn and use. However, perhaps the biggest benefit is that the system's open, standards-based HP 9000 Business Servers and robust Encina/9000 middleware establish the communication backbone that Tokio Marine & Fire will need to migrate data from its mainframes to more economical servers in the future.

"This system provides a base for further reinforcement of our corporate structure and enhancement of customer service, and protects us from major changes expected to occur in our business

environment," states Noboru Araki, Vice President of Tokio Marine & Fire. "We will use it as our information infrastructure for the next two decades."

Architecture

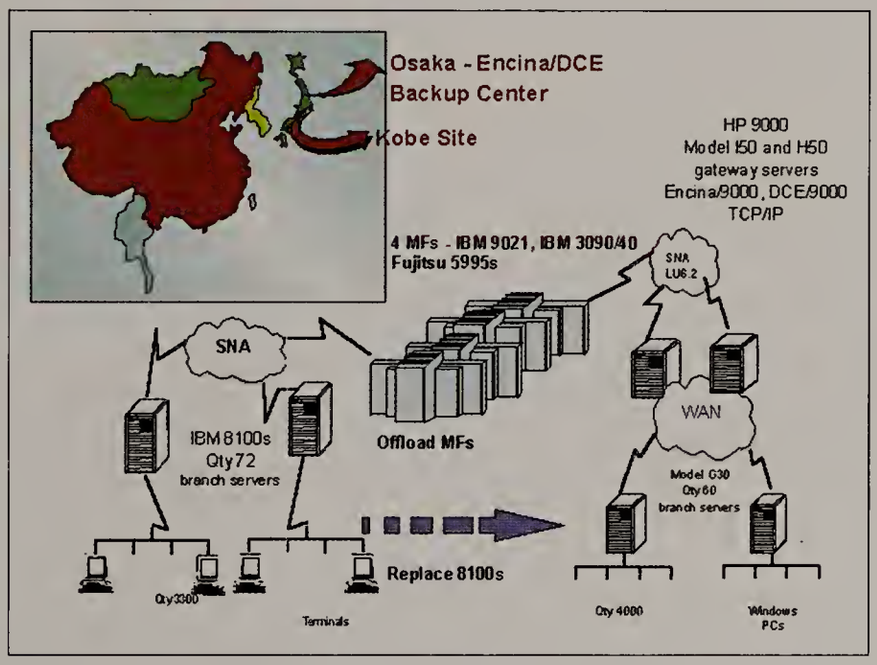
Tokio Marine & Fire's client/server architecture, designed by HP, consists of 70 HP 9000 Business Servers and 4,000 desktop computers, running the graphical user interface (GUI) Microsoft Windows, to link all 440 of the company's branch offices nationwide. The branch servers enable application sharing, check numeric data fields and store actuarial tables for trial premium calculations to save time in accessing the mainframe database for this frequently used application.

LANs within each center connect the PCs, while two additional HP 9000 Business Servers perform as gateway servers at the two processing centers. The gateway servers communicate with the mainframe CICS, balance the processing load across the branches and manage applications on the branch servers.

Encina/9000 routes transactions from the branch PCs to the mainframe via HP 9000 Business Server gateways and enables users at each branch to share applications. This meets the company's IT goals, which are to:

- Serve a large on-line system, running 700 applications and up to 8,000 simultaneous sessions.
- Release application software from direct execution of such complicated functions as network control.
- Allow programmers to develop applications using an application programming interface.
- Provide an infrastructure for managing branch server applications from a central management console.

According to Hiroyuki Shibuya, Information Management Division Network Section chief and project manager for Tokio Marine & Fire, "Encina/9000 plays an important role in our system's transaction scheduling, load distribution and failure monitoring, and it was the only transaction processing monitor that is based on the OSF DCE. But, it is the execution middleware that HP has developed that enables us to operate Encina/9000 in this large-scale on-line system."



Results

Tokio Marine & Fire's new OLTP system, which is a pioneer application of UNIX, Encina/9000 and DCE/9000, has been in production since July 1994. Comprising some 700 on-line subsystems that range from contract inquiry and loss claim reporting to sales support and accounting, it is one of the world's largest open client/server systems. ■

This supplement, sponsored by the Open Software Foundation (OSF), offers contributions from leading companies that promote the open systems industry and OSF's Distributed Computing Environment (DCE) technology. For more information about a specific company's products and services, please contact them directly.

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With more than 56,000 people in over 120 countries, Deloitte & Touche Tohmatsu International (D&T) is one of the world's leading management and information technology consulting firms. D&T's distributed computing infrastructure (DCI) practice area is focused on providing consulting services to support our clients in building secure and robust business systems. D&T's DCI group has expertise in several important distributed technologies, including transaction processing monitors, OSF/DCE, and object request brokers, and implements each with the objective of achieving sustained business benefit. For more information, please call Trevor Gee at 213-688-5282 or E-mail dce-info@dttus.com.

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Digital Equipment Corporation is the world's leader in open client/server computing solutions from personal computers to integrated worldwide information systems. Digital's scalable 64-bit Alpha platforms, networking, software and services, together with industry-focused solutions from business partners, help organizations compete and win in today's global marketplace. Digital has built strategic alliances with customers, value-added resellers, independent software vendors, systems integrators, and other computer vendors to address the needs of a rapidly changing marketplace. Digital is fully invested in and clearly focused on understanding and responding to customer needs in every industry where it can add significant value and where it can offer services and products that help customers succeed. The corporation does business in 100 countries, developing and manufacturing products in the Americas, Europe, and the Pacific Rim.

Digital Equipment Corporation offers DCE solutions with products offered on the Digital UNIX, OpenVMS VAX and Alpha, Windows NT and Alpha platforms with DCE for Windows 95 on the way. Information on the full range of DCE product offerings is available on the web at http://www.digital.com/info/dce/. For other questions, send mail to peggy.mcgrath@lkg.mts.dec.com or call 508-486-5250. DCE products may be ordered through the web page or call DECdirect at 1-800-344-4825.

Open Horizon

Open Horizon, Inc. is a leading provider of standards-based connectivity software that assists organizations in moving from departmental to enterprise-wide client/server solutions. The company builds and markets Connection, the first product to provide new or existing applications with plug-and-play access into enterprise services, such as heterogeneous databases, user authentication, data encryption, directory services and transaction processing monitors, for both 2-tier and 3-tier client/server architectures. Open Horizon was founded in 1993 and is headquartered in Belmont, California. For more information about Open Horizon send email to info@openhorizon.com, call 415-598-1200, or visit the Web site at http://www.openhorizon.com.

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Gradient Technologies, Inc. is the world's leading independent provider of DCE software and services including PC-DCE for Windows 3.1, PC-DCE/32 for Windows NT, and SysV-DCE for UnixWare. Additionally, Gradient is the developer of the industry standard software licensing system, iFOR/LS, and the EZ-LoK Application Developer's Kit. Users of Gradient's products and services include AT&T GIS, Oracle, IBM, Hewlett-Packard, Hitachi, Sequent and many independent software vendors. Gradient Technologies, Inc. is privately held and located in Marlboro, Massachusetts, USA, with worldwide distribution. For information about Gradient, call 508-624-9600 or see the Gradient web site at http://www.gradient.com.

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HP is the second-largest computer supplier in the United States, with computer-related revenue in excess of $25.3 billion in its 1995 fiscal year. Hewlett-Packard Company is a leading global manufacturer of computing, communications and measurement products and services recognized for excellence in quality and support. HP has 102,300 employees and had revenue of $31.5 billion in its 1995 fiscal year.

For DCE information please call 800-637-7740 or 408-725-8111, or for HP sales information call 800-637-7740 or 415-857-1501. See the HP Web home page at: WWW.HP.COM

IBM

To help customers solve distributed computing problems, IBM is making connectivity open and easy across IBM's and competitors' platforms. The IBM implementations of Open Software Foundation's (OSF) Distributed Computing Environment (DCE) provide the underpinning for the IBM Open Blueprint, an architecture that describes IBM's commitment to openness and interoperability.

IBM has optimized OSF DCE for all of the IBM major platforms, AIX, MVS/ESA, OS/2, OS/400, VM/ESA, and Microsoft Windows too, while maintaining complete interoperability with all OSF-based DCE implementations. IBM also offers DCE tools and products such as CICS/6000 and Encina/6000 — putting IBM's CICS to work on high-performance RISC System/6000 to provide a complete OLTP environment; and OpenEdition DCE Application Support for MVS/ESA, IMS and CICS features — allowing access transparent access to IMS and CICS transactions.

To complete a distributed computing solution, IBM offers DCE consulting and network integration services, education — including publications and videos, and reliable IBM hardware to run your DCE and other software. For more information about DCE, please call 800-IBM-3333, STAR200; email odcm @ austin.ibm.com, or check our Web Site: http://www.europe.ibm.com/client_server/dce

IntelliSoft Distributed Computing Solutions

IntelliSoft Corporation is a training and consulting firm specializing in distributed computing and open systems technologies. Since 1991, IntelliSoft has specialized in the Open Software Foundation's (OSF) Distributed Computing Environment (DCE). IntelliSoft has an established reputation for developing a broad training and consulting curriculum for early adopters of DCE technology. In 1994, IntelliSoft broadened its offerings to include niche toolkits, the first of which was a multi-threaded lock manager library and API for DCE applications. This year, IntelliSoft hopes to introduce a series of new products in the areas of DCE productivity and management. The first product will be a commercial protocol analyzer for the DCE protocol suite. For more information, please call 508-635-9070, email us at info@isoft.com or access our home page at http://www.isoft.com.

OSF

The Open Software Foundation (OSF) delivers open systems technology innovations in the areas of interoperability, scalability, portability and usability to the computer industry. With more than 380 members, OSF leads a coalition of worldwide users and vendors from industry, government and academia in collaborative research and development projects.

OSF offers a variety of technologies, prototypes and programs to the open systems industry. The OSF Open Software Mall is a World Wide Web (WWW) based software repository that facilitates distribution of open systems technology and services to users. Other offerings from OSF include: the OSF Distributed Computing Environment (DCE); OSF/Motif graphical user interface, OSF/1 operating system; and a variety of WWW and Advanced Technology Offering (ATO) programs including DCE Web, JAVA Ports and Evaluation, Mach Microkernel Operating System as well as the Microkernel Unification ATO, Distributed Security and Architecture Neutral Distribution Format (ANDF).

For more information about OSF membership, technologies or available literature, please contact OSF Direct Channels at 617-621-7300, email direct@osf.org, or check the OSF Web home page URL: http://www.osf.org

TRANSARC

Transarc Corporation is a leader in client/server computing and a major DCE developer and distributor. Transarc's products deliver scaleable, secure and reliable systems that tie together resources from the desktop to the mainframe. Transarc's Encina is a DCE-based software computing infrastructure used to develop, execute and manage enterprise-wide client/server systems. Encina adds business-critical capabilities to the DCE, including transactional integrity, failure management and load balancing. Transarc develops DCE for Sun Microsystems computers, and provides this and other high-volume DCE platforms to end users through its Transarc Sales Group and through a network of international resellers. The DCE Distributed File System was developed by Transarc. For more information call 412-338-4400, fax 412-338-4404, email sales@transarc.com or visit our Web site http://www.transarc.com

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Intel

CONTINUED FROM PAGE 37

formity to run complex applications," said Martin Reynolds, an analyst at San Jose, Calif.-based Dataquest, Inc., a market research firm.

This push to develop standards, reference platforms and even motherboards hasn't been lost on users who are implementing large client/server applications based on Windows NT Servers that run on Intel servers.

"We've had a high-end multimedia project on the drawing board for some time, but the hardware and the software weren't really there before," said an IS manager at a New York-based bank who asked to remain anonymous. "Now it looks like it's all coming together — not as fast as we'd like, but it's happening."

Ace server

Compaq currently leads the PC server market with 37% of the market in the third quarter of 1995, according to International Data Corp.

This integration effort hasn't been without its fumbles. The November release of Intel's Pentium Pro server motherboard was delayed by problems with the chip set.

By the end of this quarter, Intel will be shipping the 450GX, a quad-processor motherboard that PC vendors will use as the basis for high-end SMP cut to fit for high-end financial, multimedia, database and Internet applications.

Initial systems should be available by the end of the quarter, but users should expect most systems in the second quarter. Prices for the quad-processor Pentium Pro systems may start at about $8,000, sources at several hardware companies said.

New Product

Compaq Computer Corp. has introduced Scanner Keyboard, a keyboard with a built-in optical scanner.

According to the Houston company, Scanner Keyboard combines a high-performance scanner with an extended-function keyboard. It lets users input paper and images into a PC and link the information to software applications. The keyboard's scanner launches the scanning application when it senses that paper is present.

The keyboard integrates document-management software with optical character recognition features. It supports an optical resolution of 200 by 400 dot/in. It plugs directly into a PC's serial port and keyboard port without an interface board.

Scanner Keyboard costs $349.

▶ *Compaq Computer*
(713) 514-0484

StrongArm

CONTINUED FROM PAGE 37

results "are much slower processors for the same number of batteries," Turley said.

StrongArm also has built-in support for sound, voice and handwriting recognition.

"That extra functionality will be especially [interesting] for the next generation of PDAs, which now struggle with handwriting recognition," said Tim Bajarin, president of Creative Strategies, Inc. in San Jose, Calif.

The SA-110 StrongArm is the first in a planned family of processors, a Digital spokeswoman said. The company plans to improve the performance of this general-purpose processor for PDAs and other devices. It also will seek markets for StrongArm processors optimized for a particular use such as smart phones, the spokeswoman said.

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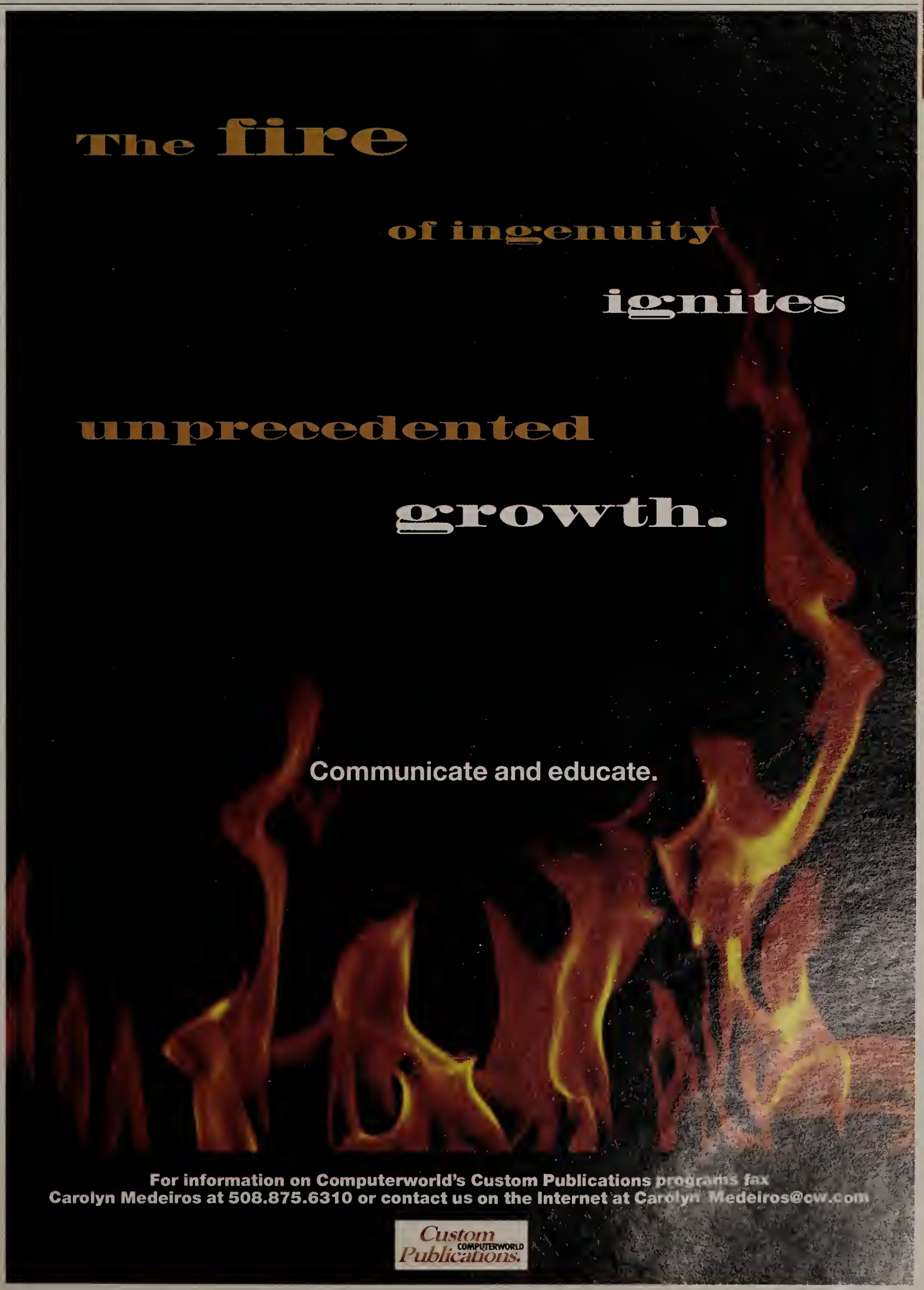
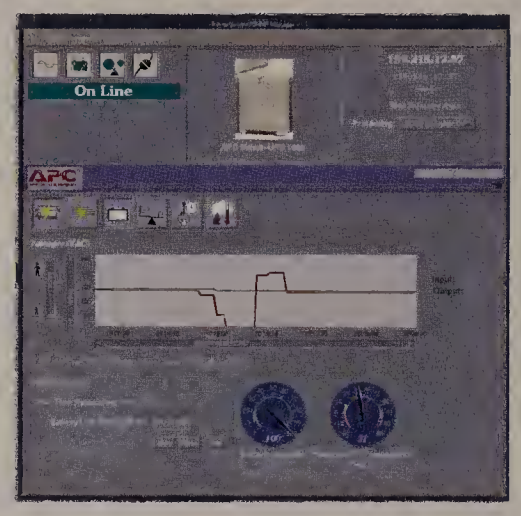


You can leave network chance, or leave it to new

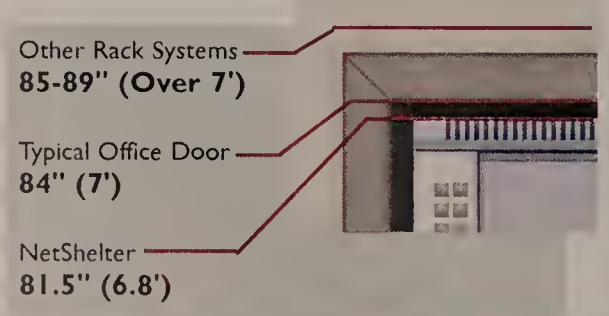
Introducing NetShelter — a high quality, free-standing rack enclosure for storing all your network and power protection equipment. NetShelter saves floor space, eliminates cabling "rat's nests," and physically protects your equipment to keep your network running — all in an attractive, user friendly design. When integrated with APC's power protection, management, and environmental monitoring options, NetShelter provides a total solution for protecting your network environment.

Designed for easy selection and easy installation

NetShelter provides 73.5 vertical inches (42U) for industry-standard, 19-inch, rack-mount equipment as well as computer-grade ventilation to reduce heat build-up. There's no need to spend hours selecting from dozens of configurations. APC makes it easy with a complete rack package right out of the box, requiring no cabinet assembly. The unit fits through standard office doors (unlike other racks... surprise!) and rolls into place on its integrated stabilizing feet with casters. Back rails can be repositioned to various depths and cross members can even be relocated for side-mounted equipment and cable management.



With optional accessories including Measure-UPS you can be warned about threatening events such as high-temperature or unauthorized access and prevent damage or downtime before your users–or management–even know there's a problem. Available for local, SNMP, and out-of-band management.



The easy access you want, the security you need

Access to the sides of the cabinet for equipment installation and service is provided in seconds by simply unlatching the locking side panels.

Moreover, locking handles in both the front and rear provide a tamper resistant environment. Optional switch kit combined with an APC Measure-UPS permits cabinet access monitoring for remote locations or during non-business hours.

Full Compaq® compatible rack for 20% less

Choose APC NetShelter for easy installation of Compaq's Rack-Mountable ProLiant® Server line, external disk storage and monitor shelf with our optional mounting kit, at a total price much less then comparable premium enclosures. NetShelter's fully ventilated design exceeds Compaq's requirements for third-party racks.

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When your system needs exceed one cabinet, you can easily create a bay of connected NetShelters in minutes! Unlike other rack enclosures, NetShelter expansion requires minimal time, cost and parts. Simply connect your first NetShelter to our expansion model that includes preinstalled baying hardware and use the side panels from your original.

"The Smart-UPS not only cuts the leading edge of power protection, its PowerChute plus software also delivers full management and control... [with] the best combination... of new and innovative features."
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See Chart Below Right		
3. CHOOSE SOFTWARE		
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PowerNet Agent for SNMP-based NMS		$169-$219
PowerNet Manager (requires agent and/or adapter)		$199-$499
4. CHOOSE OPTIONAL ACCESSORIES		

SmartSlot Accessories	Part #	Description	Price
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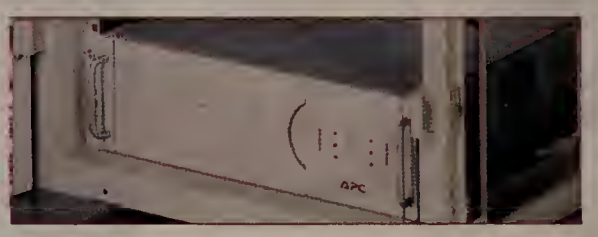
PowerNet SNMP Adapter	AP960S AP9603	SNMP UPS management for 10Base-T For 4 or 16Mbps token ring	$399 Ask
Remote UPS Mngmt Device	AP9608	Remote UPS control via modem	$159
Measure-UPS II	AP9612TH AP9612T	Temp, humidity and external sensors AP9612TH without humidity sensing.	$199 $149
Relay I/O Module	AP9610	Monitoring and control via dry contacts	$179
External Accessories	**Part #**	**Description**	**Price**
SmartSlot Expansion Chassis	AP9600	Allows an additional SmartSlot accessory to be used external to the UPS.	$79
Share-UPS	AP9207	For up to 8 servers sharing 1 UPS	$349
Measure-UPS Switch Kit	AP9813	Monitor cabinet access via Measure-UPS	$99



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- SmartSlot™ accessories offer custom functionality.
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- QuickSwap™ allows safe and easy replacement of batteries while the system stays up
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Rating	Part#	Runtime	Price
700	SU700RM	5	$649
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1400	SU1400RM	11	$1079
2200	SU2200RM	50	$1849
3000	SU3000RM	46	$2679

reliability to NetShelter™

UPS power management and diagnostic features increase uptime, reduce staff costs

PowerChute plus offers unattended system Shutdown, extensive UPS testing/status, Remote UPS management and Environmental/power monitoring so you can head off potential downtime. For SNMP-based WANs, APC's PowerNet provides comprehensive control from your network management console.

Share-UPS™ offers reliable shutdown for multiple servers even for different OS

Provides a rack mountable solution for unattended safe shutdown of up to 8 servers (running the same or even different operating systems)-all from one UPS. Now you don't have to buy a separate UPS for each server in a mixed-OS environment.

Measure-UPS™ accessory monitors NetShelter's environment even during power outages

APC's Measure-UPS prevents data or hardware damage by monitoring temperature, humidity, physical access and other external sensors. When alarm conditions occur, Measure-UPS along with APC software can alert you and initiate a safe system shutdown. Moreover, network management nightmares like unauthorized access can be easily monitored with our Measure-UPS switch kit for NetShelter door openings.

ProtectNet™ data & network surge protection blocks "backdoor" surge damage, guaranteed to $50,000

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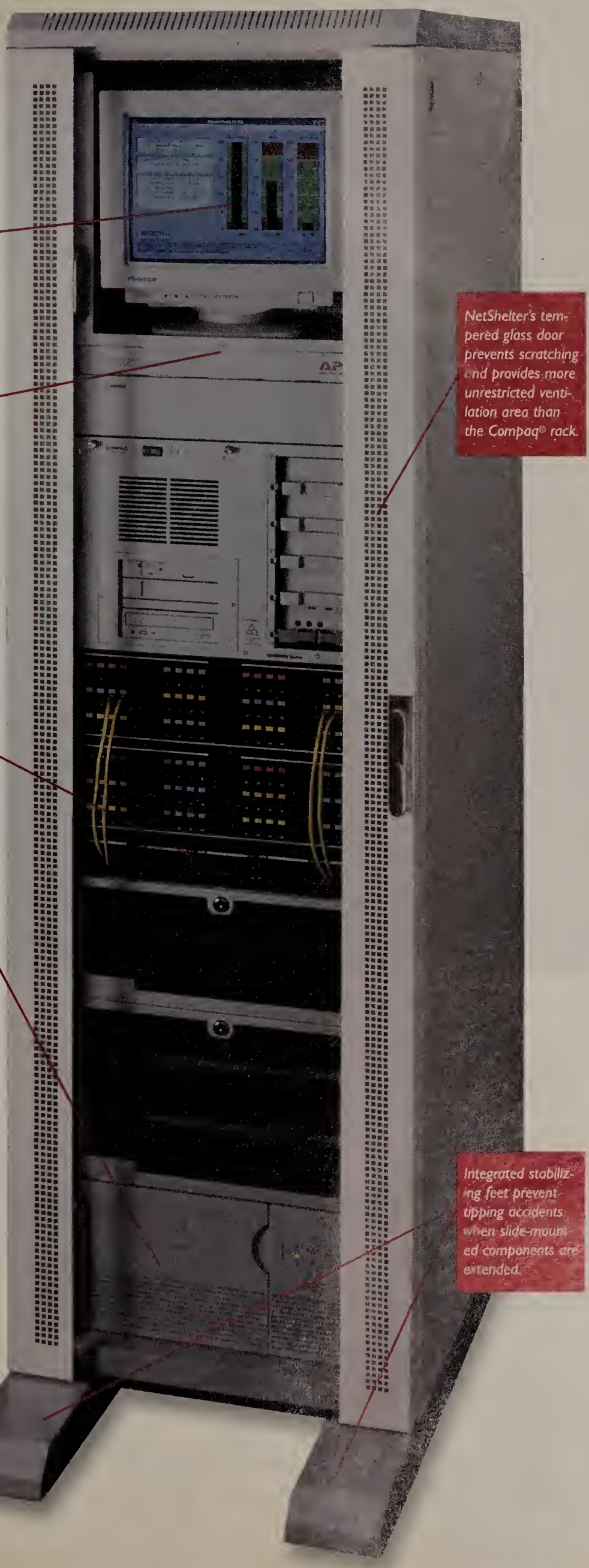
Smart-UPS RM rack-mount UPS provides performance power management for advanced networks

The ideal uninterruptible power supply (UPS) for rack mounted file servers, hubs, routers, telecommunications systems and other mission-critical equipment within NetShelter.



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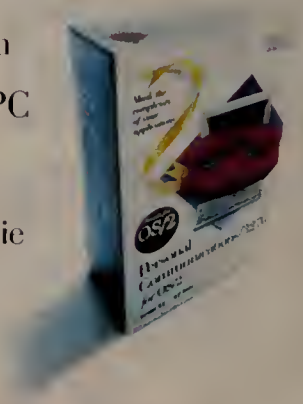

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NEW PRODUCTS, 46

Software

CLIENT/SERVER APPLICATIONS • DEVELOPMENT TOOLS • OPERATING SYSTEMS

SAS app eases finance logjams

By Julia King

As expected, SAS Institute, Inc. last week took the wraps off its first packaged client/server software. The company's new finance application was designed to shave weeks from the accounts consolidation and reporting process at large corporations.

This is because the software enables users to tap in to, summarize and report on data recorded in multiple ledger systems of different vendors. Using built-in on-line analytical processing (OLAP) tools, users can incorporate nonfinancial data — such as word processing documents or electronic-mail messages — into any reports they create on the fly.

Priced at $65,000 for a 10-user license, the client/server package is scheduled to ship this summer.

Much of the code for SAS' financial reporting package was written by **Jim Goodnight**, *the company's founder and president*

Time is money

"The business benefits are that it shrinks the lag between [financial] closing and reporting from months to days," said Mary Munn, program manager for corporate finance in SAS's newly formed Business Solutions Division. "It also increases accuracies because there is no re-keying of data."

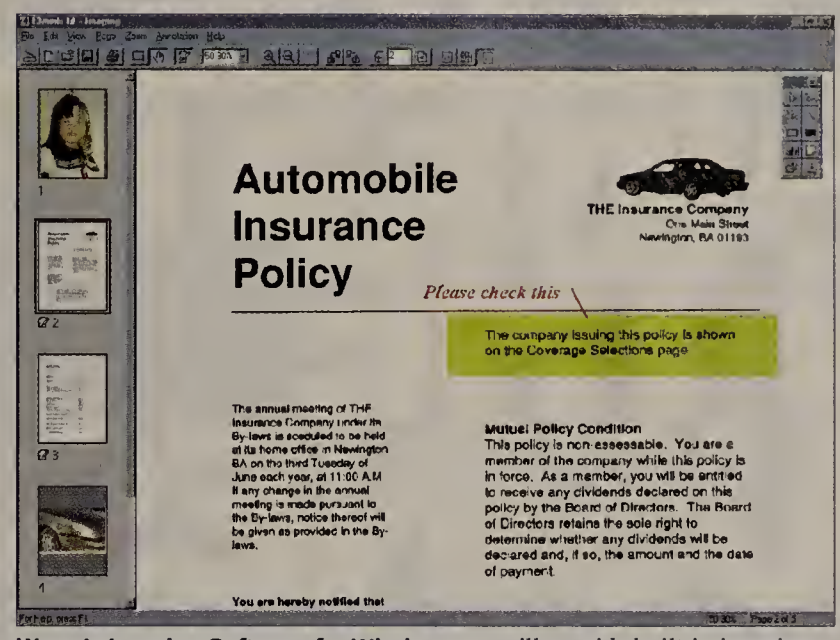
To keep tabs on their finances, users often have to re-enter large quantities of transaction data into PC-based spreadsheets to generate reports. In other cases, users must submit requests for reports to the information systems department, a process that tends to get backlogged and can take weeks or longer.

Cardinal Health, Inc., a pharmaceutical wholesale company, beta user and SAS development partner in Dublin, Ohio, is using the package to generate month-end summary reports of transactions processed by disjointed systems across its divisions.

The company's managers previously had no way to view and analyze this data easily, said Dan Bruening, director of operational analysis. Instead, they culled information from piles of hard-copy reports.

As a development partner, Bruening said he and many of his colleagues are contributing ideas, including an on-screen viewpoint feature, that are being incorporated into the SAS software.

The view-point option lets users display and compare various budget and expense figures without having to drill down through several screens of data.



Wang's Imaging Software for Windows 95 *will provide built-in imaging support for users of Windows 95 and, by the end of the year, Windows NT*

Image pioneers

Wang leads charge into red-hot imaging market

By Suruchi Mohan

Wang Laboratories, Inc. may have set up a de facto imaging standard with its new imaging product.

Called Imaging Software for Windows 95, this product can be downloaded free from the Internet. It is the first product to come out of the company's alliance with Microsoft Corp., which began last April.

Because of Microsoft's pervasive operating system presence, by the end of 1997, imaging software will be on 100 million desktops with Win 32 capabilities, said Jim Garden, director of syndicated services at Technology Business Research, Inc. in Hampton, N.H. This marks the "emergence of a de facto standard in a market that wasn't able to come up with one. This will spur a new wave of automation," he said.

While imaging has traditionally been used in high-end applications, users are now beginning to see the importance of the technology on the desktop. For example, the ability to manipulate a fax document like a regular text document could be a big plus for many users.

What it can do

Imaging Software for Windows 95 will provide built-in imaging support for users of Windows 95 and, by the end of the year, for Windows NT. This means users will be able to scan in paper documents and view, annotate

Imaging, *page 46*

CA leaps into object-oriented arena; will users?

By Dan Richman

Computer Associates International, Inc. has announced Jasmine, an object-oriented database management system, and Jade, an application development environment. Both were co-developed with Fujitsu Ltd.

Jade will let users create multimedia applications that run on the Jasmine object-oriented DBMS server and — with no changes — on Internet browsers as plug-ins. Plug-ins are applications that are downloaded automatically to users' browsers when users connect to a World Wide Web site.

CA is the only major relational DBMS vendor to release a stand-alone object-oriented DBMS rather than merge relational and object technology in a single product. CA is betting it can bring object-oriented DBMSs out of the single-user scientific and engineering realm, where they excel, and into the corporate information systems mainstream.

Multimedia

CA also figures that multimedia applications will become as important to corporate users as transaction processing and decision-support applications.

The big question: Will users buy it? Some said they will, but not soon.

A typical response came from Frank Pellegrino, IS director at the Public Broadcasting Service in Alexandria, Va. "I can't see us using it within the next year because we have more mainstream, relational projects to take care of. It's definitely something for the future."

Fujitsu spent eight years and up to $50 million developing the technology that underlies Jasmine; CA spent more than three years and "a huge chunk of money," said Yogesh Gupta, senior vice president of product strategy at CA.

Natasha Krol, an analyst at Meta Group, Inc. in Stamford, Conn., said, "CA as a company has traditionally made money capitalizing on markets at maturity or in decline. Now it's getting into an area where it's leading. It remains to be seen whether [CA] has what it takes to get and stay out front."

CA will give away Jade, which is available now. It will likely give away the Jasmine client, which will run under Windows and on major Internet browsers. CA will charge $2,000 for the Windows NT version of Jasmine's server and up to six figures for the HP-UX, AIX and Sun Microsystems, Inc.'s Solaris SPARC implementations, all of which will ship by November.

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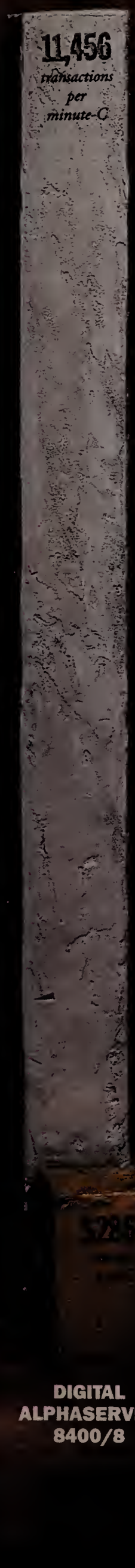

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Tool links pie charts, text, graphs

Changing one element changes them all

By Dan Richman

Users of a new query tool from a small vendor will gain the ability to mix charts, text and spreadsheets in on-screen and printed reports.

All the elements are linked, so a change to one — or to the data underlying it — changes all of them. Users said they like the new capabilities.

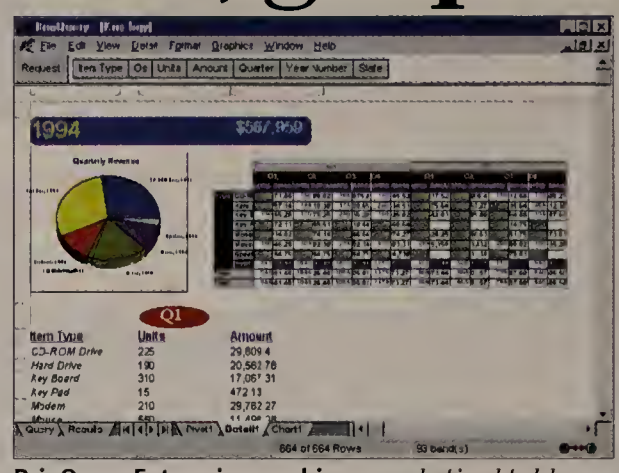
BrioQuery Enterprise 4.0, announced last week by Brio Technology in Mountain View, Calif., runs against major relational database management systems. It takes data that has been put in a separate place — known as a data warehouse — and analyzes it with a multidimensional engine. This scenario is known as relational online analytical processing.

Staeppan Snyder, a system analyst at LifeScan, Inc. in Milpitas, Calif., said his end users "have been champing at the bit for a tool that will retrieve warehouse data and format it in a way that links one format to the other, whether that's charts, graphs or text."

Still to come

Oddly, however, while the product can create pie and bar charts, it still can't produce line graphs, Snyder said. Those features will be added within three months, promised Katherine Glassey, Brio's executive vice president.

BrioQuery Enterprise, the successor to 3-year-old BrioQuery, can import unlimited quantities of data without SQL commands. BrioQuery was limited to 25,000 rows, which restricted Brio's largest users, Glassey said.



BrioQuery Enterprise combines *analytical tables, spreadsheet fragments and charts in one report*

BrioQuery Enterprise includes an engine for interpreting meta data, or data about data. This can be done from a wide variety of computer-aided software engineering tools, loading tools and other products that create data warehouses, said John J. Rome, assistant data administrator at Arizona State University in Tempe.

Multiple platforms

BrioQuery Enterprise 4.0 is the first release of the product, despite its version number. It is set to ship by March 1 for Windows, Macintosh and Unix. The Designer edition, for information systems managers, will list for $4,995 for Unix and $2,995 for the other platforms. End users will pay $1,795 for Unix or $795 for other platforms.

BrioQuery holds only about 8% of the query-tools market, according to figures from Meta Group, Inc. But it is a solid contender and "really gives users some jazzy capabilities other products don't," said Robert Sheier, a senior analyst at the Hurwitz Consulting Group in Newton, Mass.

New Products

Platinum Technology, Inc. has introduced Plan Analyzer for Oracle, an automation tool for Oracle Corp. databases.

According to the Oakbrook Terrace, Ill., company, Plan Analyzer for Oracle is a Windows-based tool that automates the tuning of SQL statements for Oracle databases. It was designed to eliminate the need to manually create, display, interpret and test SQL optimization plans to increase database and application performance.

The product has a SQL capture facility that lets users trap and optimize the SQL code in development tools that include Microsoft Corp.'s Visual Basic and Powersoft Corp.'s PowerBuilder.

It also lets administrators save SQL optimization plans and performance statistics in a row-level repository. This allows them to retrieve and verify optimization plans.

Plan Analyzer for Oracle is compatible with Oracle Versions 6 and 7 and runs on Windows 3.0 or later, Windows 95 and Windows NT.

Platinum plans to add Motif support to the product in the first quarter.

Pricing starts at $1,995 for a single-user license.

▶ *Platinum Technology*
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Delrina Group, PC Docs link up

By Suruchi Mohan

Symantec Corp. subsidiary Delrina Group and PC Docs, Inc. last week announced the integration of their product lines.

With a Dynamic Link Library (DLL), users of the PC Docs document management system will now be able to manipulate the Delrina Group's FormFlow forms as they can other documents in their repository. Symantec and PC Docs jointly developed the DLL.

Document management

"FormFlow offers a company the ability to manage a process, while PC Docs manages forms critical to the process," said Paula Boyle, an analyst at Giga Information Group.

Users have always been able to capture and route information using FormFlow. But now they have the added benefit of using the functionality of a full-blown document management system. This means they can use the database-oriented workflow of PC Docs' Doc Open as opposed to electronic mail-based workflow that Delrina provides. Users also gain Doc Open's security, version control and storage features.

The Canadian Coast Guard is doing just that. Scott Prieur, manager of application development in Ottawa, has used this integration for about two months and said it has made information sharing a lot easier.

Change is good

Prieur also said that, eventually, forms processing will lead to a dramatic drop in word processor use. Many people make minimal use of their word processors once they acquire a forms package, he said. For example, someone who takes purchase orders need never get out of FormFlow. Word processing will be "eaten by forms packages," he said.

But Steve Weissman, president of Kinetic Information in Waltham, Mass., said this would depend on the application. FormFlow would work for a user writing a lot of memos, but for heavy-duty writing, a word processor would still be required.

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Imaging

CONTINUED FROM PAGE 43

and store these images as regular electronic files. But users won't be able to build production imaging systems with the software. For that, they will need a server-based imaging system, such as Wang's OpenImage.

"This is the first step anyone in the imaging market has taken to give small businesses custom imaging capabilities," said Rick Russell, a senior programmer at the Baptist Foundation of Arizona, a nonprofit investment firm in Phoenix. Russell has beta-tested the product for three months. "With the Wang client, you can put together a small imaging system at a very low cost," he said.

Thomas Lite, chief information officer at Innovision Imaging, Inc., a medical records company in Phoenix, agreed. "This is an important step for people to accept [imaging] as they did word processing. This is a very good strategy to get people comfortable with imaging," he said.

If users do in fact get comfortable with imaging, companies might expand their use of the technology.

That would put Wang in a leadership role to supply imaging at both the desktop and the back end, Garden said.

"Their competition will have to join the standard or be locked out," Garden said. "Wang has the right of first refusal on all imaging standards."

Users can find the new software on Wang's World Wide Web site at http://www.wang.com or Microsoft's Web site at http://www.microsoft.com/windows.

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- 70. Mining/Construction/Petroleum/ Refining/Agriculture
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- 23. Dir./Mgr. Sys. Development, Systems Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Management
- 60. Sys. Integrators/VARs/Consulting Mgt.

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DEPARTMENTAL MANAGEMENT
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- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No

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C. 5,000 – 9,999	❒	❒
D. 1,000 – 4,999	❒	❒
E. 500 – 999	❒	❒
F. 100 – 499	❒	❒
G. 50 – 99	❒	❒
H. 20 – 49	❒	❒
J. 10 – 19	❒	❒
K. 1– 9	❒	❒

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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11. President, Owner/Partner,General Mgr.
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DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
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90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No

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B. 10,000 –19,999	❒	❒
C. 5,000 – 9,999	❒	❒
D. 1,000 – 4,999	❒	❒
E. 500 – 999	❒	❒
F. 100 – 499	❒	❒
G. 50 – 99	❒	❒
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Technologies and management approaches that IS are deploying in order to get a better handle on distributed computing assets.

Extended Enterprise: Integrating External Information from the Web Site with Existing Corporate Applications

Extended Enterprise is a new regular feature in 1996. February's feature looks at how companies are capturing customer information from their Web site and integrating that information into their applications and databases. We'll also examine how these companies are offering better customer service by integrating their home page with the corporate database. What are the enabling technologies, cost and business/organizational concerns involved with both?

Product Focus: Networking

Firing Line: A look at CompuWare's EcoNet network manager

Test Drive: Sun Microsystems' Java

What's New: A roundup of monitoring and security tools

Careers: Team Compensation

Are there advantages to compensating IS groups involved in client/server projects on team-oriented goals rather than individual ones?

Also coming in our April issue...

Cover Story: The Warehouse Wringer

The Meta Group says users will spend $13 billion per year by 1997 on data warehouses, up from $2.7 billion today. Our cover story examines what to do to make building and implementation of data warehouses an effective investment rather than a failure.

Extended Enterprise: The Latest in Customer Support

Customer support has become one of the most competitive areas of a company's business. In our April issue, Extended Enterprise explores new trends in providing top-notch customer support using distributed computing.

Product Focus: Database Tools

Firing Line: Multidimensional databases

Test Drive: Front-end databases

What's New: The latest query tools, report writers, database tuning products and modeling products.

Careers: Learning from the Pacific Rim

Lessons IS professionals in the U.S. can learn from a first hand view of the client/server training and educational programs available to IS in the Pacific Rim countries.

April Issue

Ad Close: Feb. 21

COMPUTERWORLD CLIENT/SERVER JOURNAL

Where distributed computing meets business objectives

Software

Thanks to Java, C++ skills are hot

Vendors begin to cross-breed C++, Java tool sets

By Frank Hayes

Who would have thought the hottest new corporate development language would be so much like C++?

After all, C++ is often criticized by information systems managers as too hard to use and maintain for most applications. But Sun Microsystems, Inc.'s Java language for developing Internet applications is really a simpler, more streamlined version of C++. And that similarity — combined with Java's sudden popularity — is making C++ programming experience much more valuable in many corporate IS shops.

Development languages

"Right now we're trying to get as many as possible of our applications development folks that have C++ experience trained in Java," said Rick Brennan, manager of Web services at National Semiconductor Corp. in Santa Clara, Calif.

SourceCraft, Inc. in Burlington, Mass., hopes to capitalize on that trend. Last week the company unveiled a pair of Windows-based visual development environments: ObjectCraft for generating C++ code and NetCraft for creating Java programs.

Both tool sets let developers use an identical drag-and-drop approach to create forms and access databases. The C++ development system, which is shipping already, costs $1,995. The Java environment can be downloaded free starting in April and will cost $995 starting in July. There is no difference between the free version and the one shipping in July, SourceCraft said.

SourceCraft isn't alone in cross-breeding its C++ and Java development tools. Heavy hitters such as Symantec Corp., Powersoft Corp. and Borland International, Inc. are also adding Java development capabilities to their C++ environments.

"These tools will help those programmers with C++ to go directly to the Java environment quickly," said Mussa Khiar, a systems and network administrator at Raychem Corp., a chemical and materials company in Menlo Park, Calif.

But later this year, SourceCraft plans to roll out an environment that will allow for the exchange of program designs between the Java and C++ tool sets. Then developers will be able to build World Wide Web-based applications and partition them between C++ on servers and Java on Web clients.

That's valuable because Java lets client applications run unchanged on many types of computers, while C++ provides the speed needed for good performance on servers.

"Frankly, software development for multiple platforms has been a real nightmare for us in the past," Brennan said. "Now if people write one of those applications and it runs in Java, they're done, that's it."

Brewing Java

Java development tool sets will arrive throughout the year

Vendor	Product	Availability
Windows		
Borland *Scotts Valley, Calif.*	Borland C++ 5.0	March
	Latte	In stages, beginning second quarter
Gupta *Menla Park, Calif.*	Centura for Java	Fourth quarter
Neuron Data *Mauntain View, Calif.*	Web Element	March
Powersoft *Cancard, Mass.*	Optima for Java	Third quarter
SourceCraft *Burlingtan, Mass.*	WebCraft	April
SunSoft *Menlo Park, Calif.*	Java Workshop	Second quarter
Symantec *Cupertina, Calif.*	Cafe (formerly Espresso)	December 1995
TakeFive Software *Cupertina, Calif.*	Sniff+ for Java	First quarter
Macintosh		
Metrowerks *Austin, Texas*	CodeWarrior for Java	May
Natural Intelligence *Cambridge, Mass.*	Roaster	January
Symantec *Cupertina, Calif.*	Cafe	First quarter

R:Base 5.5: A database tool with a difference

Latest version includes drag-and-drop support

By Jeffrey Gordon Angus

Microrim, Inc.'s R:Base 5.5 for Windows is a multiplatform, powerhouse development environment that is unique in every way, good and bad.

R:Base 5.5 runs on Windows 3.x, Windows 95, Windows NT, OS/2 and DOS. It is different from popular Windows database products such as Lotus Development Corp.'s Approach 96 and Microsoft Corp.'s Access because it doesn't have wizards or other training wheels-style tools to help beginners build projects.

Version 5.5 includes drag-and-drop support and tool palettes for the Form and Report designers. The Form designer supports a wider range of standard Windows controls, including pick lists, check boxes and radio buttons. And it has more support for standard Windows interface elements such as area multiple selection and virtual pages, which are significantly larger than physical pages for designing complex forms.

Unlike other Windows databases that have well-documented programming languages — Data-Ease International, Inc.'s Data-Ease and Superbase, Inc.'s Super-Base — R:Base 5.5 for Windows wasn't really designed for slick, picture-filled applications such as human resources files that integrate employee photos with text fields. R:Base 5.5 for Windows doesn't have the fancy graphics-handling capabilities of those products.

Instead, R:Base 5.5 for Windows gives you the most thorough, traditional language for data manipulation available for the platform. It includes the full panoply of relational algebra commands. Other products let users join tables, but R:Base 5.5 for Windows also supports commands for project, intersect, union and subtract operations. This makes the program the most appropriate development tool for serious applications that don't require aesthetic bells and whistles and that will be developed by professional coders.

R:Base 5.5 for Windows will seem a lot like a ported DOS program to many developers. Everything seems quite integrated in popular end-user databases. But the Microrim product has separate modules for table definition, report design, form design and application development. The modules are connected by the Object Manager, a main, tabbed dialog box. And, in what is a boon to developers and sophisticated users, you can hop into the language's command line mode (the "R>" prompt), issue R:Base commands and get instant results.

Many developers can work much more quickly using an interpreter such as R:Base than a compiler because they can test code modules before they incorporate them into their programs.

R:Base doesn't conform as fully to Windows conventions as its rivals. For example, you can select multiple objects in a report or form and move them as a group, but there is no way to resize them as a group. On-line help sometimes behaves in a context-sensitive way and sometimes doesn't.

Some surprises

Other things may happen that will surprise developers who are accustomed to the Windows interface standard. For example, it can be easy to close the entire R:Base program rather than one of its modules if you aren't careful — you won't lose data, but it is a surprise when it happens. R:Base 5.5 for Windows also can be persnickety in Windows 3.x, demand a certain swap file size and sometimes run out of Windows resources. But that wasn't my experience while working in Windows 95.

R:Base 5.5 for Windows won't be everyone's ideal program, but its strengths make it the best development environment for serious database applications that don't require a lot of graphical deliverables.

R:BASE 5.5 FOR WINDOWS IS SHIPPING WITH A $495 SUGGESTED RETAIL PRICE. THE OS/2 VERSION IS DUE THIS MONTH AT THE SAME PRICE, AND THE DOS VERSION CARRIES A $795 RETAIL PRICE TAG. ALL HAVE A $195 UPGRADE PRICE.

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Angus is a systems analyst and consultant at The Data Works Ltd. in Seattle.

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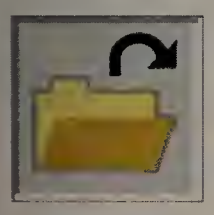

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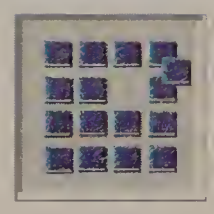

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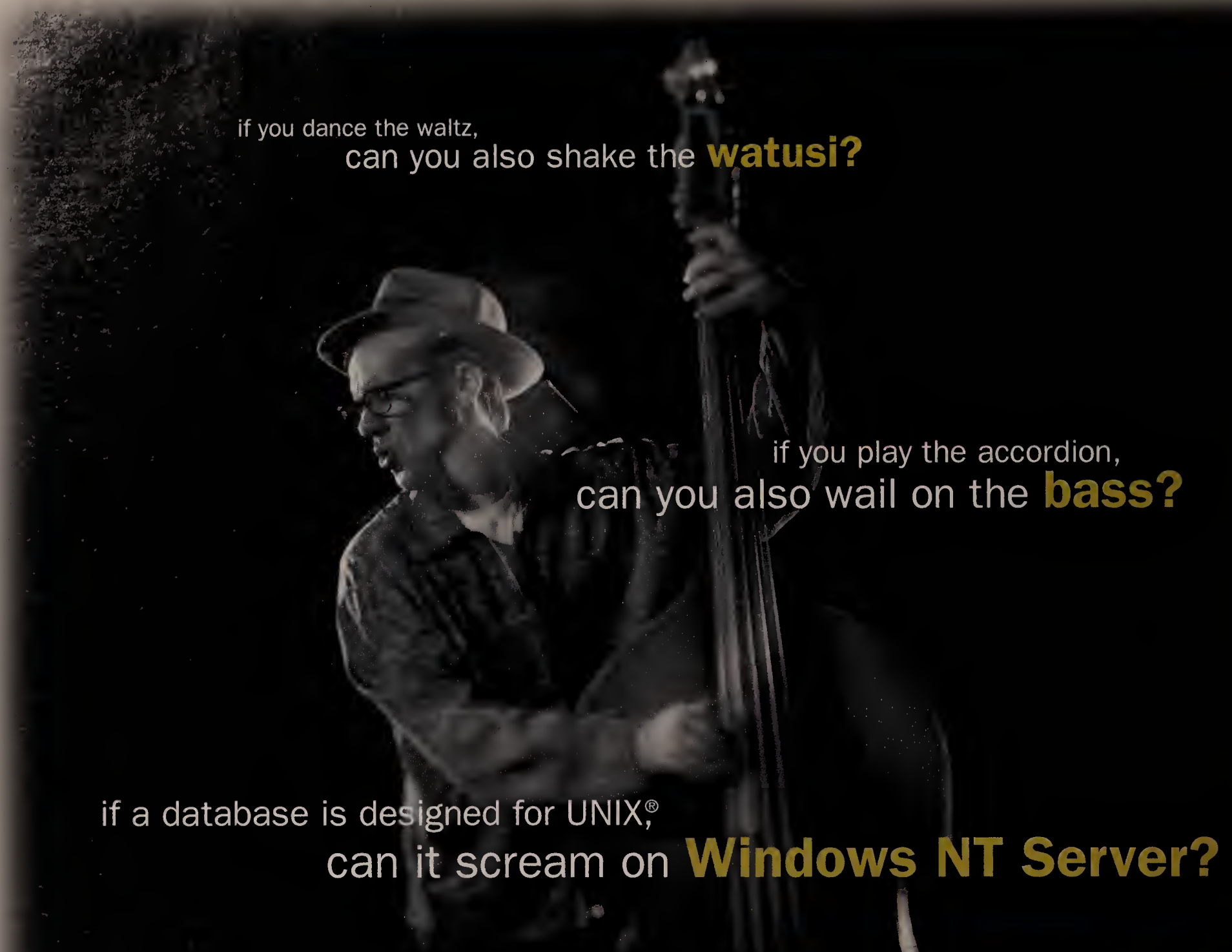

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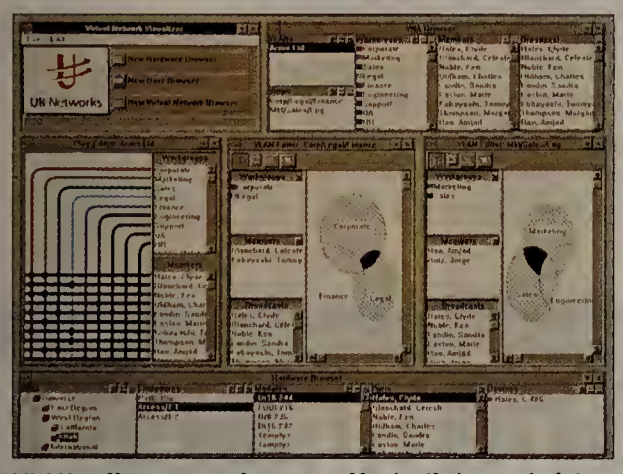
MICROSOFT UPGRADES SNA SERVER AND WIN 95, 55
ATTACHMATE ENHANCES PC-TO-AS/400 OFFERING, 55

The Enterprise Network

LANs • WANs • NETWORK MANAGEMENT



VLANs *allow users to be grouped logically instead of physically, so workers on different hubs could be put on a 'virtual' LAN with controlled access. VLANs are displayed by workgroup and member.*

Virtual LANs extend reach

By Bob Wallace

What do UB Networks users have in common with Gilligan, the Skipper, the Professor and the Howells?

All have been trapped on islands.

In UB Networks, Inc.'s case, the islands are virtual LANs (VLAN), while the characters on *Gilligan's Island* were trapped on a virtually deserted island.

Much-hyped VLANs are supposed to change the way information systems managers view internetworking by letting them organize end users logically instead of physically. Engineers on five different LANs, for example, could be put in one logical workgroup to which access could be restricted.

Until recently, those engineers would all have to be connected to a single UB switching hub. Now the vendor is extending the reach of VLANs across multiple hubs in its product line.

Virtual LANs, *page 55*

Going wireless

Mobile workers can connect to frame-relay data networks

By Neal Weinberg

AT&T Corp. and MCI Communications Corp. have added a feature that lets mobile workers hook up to their company's frame-relay data network through wireless technology.

Users have been clamoring for a way to link several technologies into a seamless network. The long-haul carriers have responded with frame relay to Asynchronous Transfer Mode interworking, dial-up access to frame relay and Integrated Services Digital Network access to frame relay.

This latest wrinkle "extends corporate resources into additional environments, so people can be productive away from wired endpoints," said Peter Bernstein, president of Infonautics Consulting, Inc. in Ramsey, N.J. People on the road out of reach of dial-in connections to the frame-relay network can connect and gain access to their files and applications over the corporate backbone.

MCI officials said the Washington-based company will provide access to its frame-relay network through the basic cellular network, which is based on circuit-switched technology. AT&T in Basking Ridge, N.J., offers circuit-switched cellular and Cellular Digital Packet Data (CDPD) technology.

Bernstein said because CDPD is packet-based, as is frame relay, users can have "a seamless packet experience via wireless that enables a lot of applications for remote connectivity that weren't available before." But CDPD isn't widely available and requires a special modem.

Terry Korus, MIS operations manager at Bemis Co. in Minneapolis, has an AT&T frame-relay network that links 45 locations across the country.

He said he is pleased that AT&T is going ahead with mobile connectivity because "the need is there."

But Korus said he is somewhat skeptical of the technology, which he said may not be "ready for prime time." Korus said he worries that wireless doesn't pack enough bandwidth for his applications.

At this point, he said, he isn't ready to jump in. "Let somebody else blaze that trail," Korus said.

Korus said he will look at wireless down the road as "the ultimate contingency plan" for his network, since wireless technology is "backhoe-tolerant."

Wireless access to frame-relay networks

	AT&T*	MCI
Type of wireless access	Cellular Digital Packet Data (CDPD)	Circuit-switched cellular
Throughput	19.2K bit/sec.	20K bit/sec.
Features	Requires special CDPD modem	More widely available than CDPD
Wireless to frame relay availability	Now	End of first quarter

*Also offers circuit-switched cellular

Tool makes it easier to change TCP/IP addresses

By Patrick Dryden

New address management software for TCP/IP networks can help administrators keep up with the frequent moves, adds and changes of users and resources without sacrificing the security of central control.

The Join server from Competitive Automation, Inc. enhances the Dynamic Host Configuration Protocol (DHCP). This standard utility pools available IP addresses and doles them out as needed to clients such as PC stations that run Windows 95, which supports only DHCP.

These IP addresses may be in short supply, and the seemingly meaningless string of numbers can definitely confuse users, who could cripple their access or even a shared server with the wrong configuration.

Plain DHCP support provided by public domain utilities or Windows NT and other servers will suffice for many Windows 95 users, said officials at Competitive Automation in Menlo Park, Calif. And administrators can stick with tools that use the Bootp protocol to manage addresses for existing devices.

But large networks demand better control, according to beta testers.

"Join gives us explicit association of addresses and node names without having to spend 20 minutes visiting every machine," said Don Rolph, a senior member of the technical staff that supports a 1,900-station network at Texas Instruments, Inc. in Dallas.

Common DHCP address assignment hobbled the setup of X Window System sessions and prevented the monitoring of certain user activities because the Domain Name Server didn't know which address was assigned to which PC, Rolph said.

"Now we merely need to know their physical addresses to control them centrally," he said. "We must maintain control to know who's doing what on the wire."

Compared with public domain DHCP tools, the Join server offers a graphical, interactive interface, better configuration parameters and support, Rolph said.

For the New York Times Co., Join provided security that was missing from the DHCP standard, according to David Brown, director of network services in the newspaper division.

Competitive Automation

Menlo Park, Calif.
http://www.join.com

Product: Join, a TCP/IP address manager.

Description: An implementation of the Dynamic Host Configuration Protocol (DHCP) service, which automates assignment of TCP/IP addresses to network devices.

Features: Runs on a Unix server with a graphical user interface for centrally defining address management policies and monitoring configuration parameters. DHCP enhancements include address restrictions for security and support for naming services.

Availability: Now for Sun Microsystems' SunOS and Solaris and Digital Unix servers.

Price: $1,500 per server to manage up to 300 addresses.

WEEK 4 OF 19

COMPUTERWORLD's

TechnoTrivia

Welcome to COMPUTERWORLD's TechnoTrivia

It's fun – and easy to play each week!

1. Look for the COMPUTERWORLD TechnoTrivia icon throughout this issue) to the TechnoTrivia questions listed on this page.
2. Enter via COMPUTERWORLD's Web site on the Internet: **http://www.computerworld.com**
3. On the Web site Entry Form, identify the page number in this week's issue of COMPUTERWORLD where the correct answer to each TechnoTrivia question appears.
4. Or you may enter by fax using the Fax Entry Form below.

Put your RAM to the test!

This Week's Questions:

1. What famous actor tried to steal IBM customers away in an early Apple II TV ad?
2. What PC entrepreneur has been knighted?
3. The Hammond Atlas of the World claims to be the first atlas created entirely from a digital database. In what year was this atlas produced?
4. What does SLIP, a protocol for accessing the Internet via a telephone line, stand for?
5. What public figure once sent the following e-mail message: "Oh Lord, I lost my slip and broke one of the high heels. Forgive please. Will return the wig on Monday."?

Trivia questions and answers provided and/or verified by Christopher Morgan and The Computer Museum.

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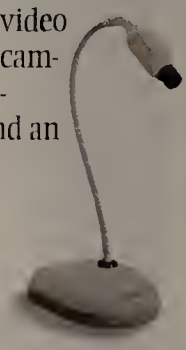

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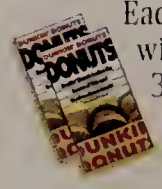

Each Tuesday five winners and their associates (up to 20 people) will receive Dunkin' Donuts gift certificates (or alternative) for 3 dozen donuts, a Dunkin'Donuts coffee thermos, a pound of ground coffee plus an engraved TechnoTrivia plaque.

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2.	
3.	
4.	
5.	

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23. Dir./Mgr. Sys. Development, Systems Architecture
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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
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Networking Products ❒ Yes ❒ No

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E. 500 – 999	❒	❒
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Networking Products ❒ Yes ❒ No

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D. 1,000 – 4,999	❒	❒
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G. 50 – 99	❒	❒
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Microsoft upgrades give better access to Internet

By Laura DiDio and Stuart J. Johnston

The upgrades of Microsoft Corp.'s SNA Server Version 2.11 and Windows 95 software don't represent a major revision, but they do substantially improve Internet connectivity, support a wider array of platforms and devices and fix minor flaws.

Service Pack No. 1 for Microsoft's SNA Server 2.11 and the Windows 95 Service Pack are free maintenance upgrades.

The SNA Server 2.11 pack expands the range of options available for linking PCs to IBM SNA-based mainframes and midrange systems. It also improves the server's integration with TCP/IP networks and makes it simpler for users to securely access IBM host data via the Internet.

The upgrade also corrects several minor bugs — such as misleading error messages — that cropped up after SNA Server 2.11 was released last July, said Vesa Suomolainen, general manager of the SNA Server Product unit at Microsoft.

Rick Shope, a beta tester and manager of PC planning and technology at NationsBank-CRT, a subsidiary of NationsBank Corp. in Chicago, said the bank plans to switch from Novell, Inc.'s NetWare for SAA to SNA Server 2.11.

Shope said NationsBank has experienced some reliability problems with NetWare for SAA. "[It] regularly drops our [wide-area network] connections and has difficulty handling a lot of data when we process the end-of-month reports — our print jobs just die," he said.

SNA Server 2.11's TCP/IP support will let NationsBank preserve its hub and router investments. It also will eliminate the need to "do a $100,000 equipment upgrade," Shope said.

He said installing a TCP/IP stack on a host can cost $50,000 to $75,000 and up, depending on the system. And it also may require hardware purchases such as a 3172 Interconnect controller, which starts at $25,000.

Among the most notable features in the Windows 95 Service Pack is support for NetWare Directory Services (NDS), which will let network administrators easily track all users and devices on Windows 95 networks from a central management console. And it will let Windows 95 users attached to NetWare 4.1 file servers log on just once and be recognized by every server on the network, regardless of location.

Microsoft also has strengthened the encryption in Windows 95's password cache, added updated drivers in the Windows 95 file-and-print sharing security mechanism and incorporated 32-bit Data Link Control Protocol software.

Components of the Microsoft service packages can be downloaded from Microsoft's file transfer protocol server on the Internet (ftp.microsoft.com.bussys/winnt/sna-public). Both packages will be available to corporate customers, but Microsoft has no immediate plans to incorporate them into its commercial products.

The new Service Pack No. 1 for SNA Server Version 2.11 includes features such as:

- TN3270E client support, the newest IEEE standard for terminal emulation.
- FTP-AFTP Gateway, which lets users do high-speed file transfers between LANs and IBM hosts without having to install a separate TCP/IP stack.
- AFTP-API support lets users automate unattended file transfers.
- Escon Channel Attachment Support, which provides fast, inexpensive mainframe connections.
- Internet Firewall compatibility, which strengthens security.
- Pricing: Free. Users can order a CD-ROM for a $14.95 handling fee.

The latest Windows 95 Service Pack contains the following new components:

- Updated password cache security, which strengthens the encryption in Windows 95's password cache.
- Updated drivers to fix problems in Windows 95 file-and-print sharing security.
- NDS support.
- 32-bit Data Link Control Protocol software to let users of 32- and 16-bit applications access IBM mainframe and AS/400 computers.
- A device driver to let Windows 95 work with infrared-enabled devices to allow communications with printers and other devices that use a wireless infrared link.
- An update to the Windows 95 user interface so that users can browse NDS printers from the Add Printer wizard.
- Updated OLE files that fix problems discovered in Word, Excel and PowerPoint, Versions 7 for Windows 95.

Attachmate turns to NetSoft

Licensing of NS Router improves PC-to-AS/400 product

By Laura DiDio

Connectivity kingpin Attachmate Corp. recently teamed up with another vendor to beef up its PC-to-AS/400 offering.

Attachmate licensed NetSoft, Inc.'s NS Router, which runs on Microsoft Corp.'s Windows 3.1, Windows NT Workstation and Windows 95. This provides users with new management features that allow managers to easily monitor multiple IBM AS/400s from within the Windows environment via simple drag-and-drop commands.

Attachmate will embed NetSoft's Windows 3.1 product in Rally, its AS/400 connectivity software. Additionally, Attachmate will incorporate NetSoft's Windows NT Workstation and Windows 95 connectivity and file transfer software for inclusion in its Extra Personal Client software.

The demand for PC LAN-based connectivity to the IBM midrange environment is expected to be strong for the next several years, analysts said. PC LAN-to-IBM midrange host connectivity software sales will reach an estimated $370 million this year, up from about $100 million last year. Unit shipments of the software will soar to 2.1 million units this year, up from 1.3 million units last year, according to statistics supplied by Elisabeth Rainge, an analyst at International Data Corp. in Framingham, Mass.

No price hikes

A spokesman for Attachmate said the Atlanta-based firm will pay NetSoft royalties as part of the licensing agreement, but Attachmate won't hike the price of its Rally and Extra Personal Client software.

Attachmate's Rally software for Windows 3.x PCs will remain at $4,500 per server license, with connectivity to an unlimited number of clients. The price of Extra will similarly hold steady at its current list price of $425 per client. The software is available now.

Virtual LANs

CONTINUED FROM PAGE 53

UB is one of several switching hub vendors that offer VLAN capabilities. Their schemes are proprietary because there isn't a VLAN standard yet.

UB's moves mean its VLAN users won't have to connect to one hub and can be in different locations. The new feature works with most of UB's product line, including its GeoLAN/500 Super Switching Hub, the GeoSwitch/155 ATM Switch and the GeoRim/E Ethernet Switch.

Users expressed cautious optimism for VLAN technology.

"In general, it offers some very positive capabilities, like the ability to restrict access to workgroups such as legal and finance," said Virgil Palmer, manager of computing and telecommunications infrastructure services at Air Products & Chemicals in Allentown, Pa.

Analysts say the key to user acceptance of VLANs is the availability of packages that let IS managers configure, view and reconfigure the VLANs. "With a technology as new as VLANs, you can't expect users to dive in whole hog without a solid management package," said John Morency, a principal at The Registry, Inc. in Newton, Mass. "The dearth of comprehensive [offerings] has hurt VLAN deployment."

UB has started shipping a prototype of Virtual Network Visualizer (VNV), its new VLAN management package, at no charge for evaluation purposes. The prototype UB package runs on Windows NT and Windows 95.

VNV lets IS managers graphically visualize and manage VLANs. They can perform moves, adds and changes, implement security measures and take steps to optimize network bandwidth.

VNV eventually could be used to manage non-UB equipment, though that would require UB or other vendors to write special software to enable VNV to create a VLAN that comprises UB gear and other vendors' devices.

UB officials said the firm is interested in broadening VNV's reach beyond UB equipment but stressed that so far there is no standard way to create multivendor VLANs.

"I hope they go with the generic approach, which can manage multiple vendors' products, rather than restricting their [scheme] to UB products," Palmer said. "They have a nice front end, which is pretty impressive and would provide the best value if packaged to cover a broad array of vendors' products."

Coming soon

The next step in UB's VLAN blueprint is to enable the creation of VLANs by end-user media access control address, which would enable workers to move anywhere in the network without reconfiguring the VLAN.

New Product

Proteon, Inc. has introduced Client Server Exchange 900E, an Ethernet switching concentrator.

According to the Westboro, Mass., company, the product provides client/server connectivity through a high-performance, single workstation, 10Base-T repeater/switching fabric. It includes 24 10M bit/sec. ports for local-area connections or links to high-end servers.

Client Server Exchange 900E has two autosensing switching ports that give users a dedicated connection to servers, high-speed daisy chain connections, high-speed backbone connections or a low-speed shared LAN connection.

Pricing for Client Server Exchange 900E starts at $2,575 for single units.

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WEB TOOLS GIVE SITES GRAPHICS PIZZAZZ, 58
NEW PRODUCTS, 59

There's a new traffic cop on the beat

Net.Analysis helps Web site operators monitor, analyze traffic patterns

By Mitch Wagner

The Net.Genesis Corp. has introduced a tool designed to allow World Wide Web site operators to keep track of overall traffic and who goes where on their sites.

The Net.Analysis tool enables Web site operators to analyze traffic patterns and determine statistics such as how many visitors a Web site receives overall. It also can reveal whether those visitors come from commercial or educational accounts and what time of day they are most likely to visit.

Web analysis

Dean Marino, webmaster at Dow Chemical Co. in Midland, Mich., said a tool such as Net.Analysis could be a great value for companies looking to justify the cost of running a Web site. "It brings Web-based marketing in line with other media," he said.

Companies can use Net.Analysis to fine-tune their sites for maximum marketing impact, said Eric Richard, director of product development at Net.Genesis in Cambridge, Mass.

Marino said users seek the same kind of viewership statistical analysis for Web sites that is available for television.

The software will fill an important gap in Web measurement tools. Most companies still measure usage in terms of "hits," or how many times individual files are accessed. But Web experts say hits are a crude way to measure traffic, almost to the point of being useless.

If a single site is made up of 50 files that are accessed by 1,000 visitors 10 times each, that counts for 500,000 hits — the same as a site made up of a single file accessed by 500,000 visitors once.

The right tool for the job

Many users are writing their own tools for analyzing Web traffic usage using the awk or perl Unix languages. Others use shareware and freeware tools or traffic analysis tools built in to full-service Web servers.

Now other tools, such as Net.Analysis, are emerging that do nothing but measure Web usage. They include SiteTrack from Group Cortex in Philadelphia and WebTrends from E. G. Software, Inc. in Portland, Ore.

The Net.Analysis software is available now and costs $2,995 for a client/server bundle. The server runs on Sun Microsystems, Inc.'s Solaris 2.4, and the client runs on Solaris 2.4, Windows NT and Windows 95.

Anonymous remailers

CONTINUED FROM PAGE 1

Critics are calling for strict limits or an outright ban on remailer sites, but others insist they are a safeguard against electronic snooping by abusive governments and should be considered a political freedom.

Anonymous remailers have been used in a variety of criminal acts, including distributing pornography and computer viruses, violating copyright laws and harassing people with nasty messages.

One snowy day last month, for example, about 25% of the workforce at a defense contractor in Rockville, Md., went home after they received a bogus E-mail message dismissing them for the day. The message originated from an anonymous remailer that allowed the user to impersonate a senior company official.

But there are more scary, less publicized uses of remailers, said Paul Strassmann, former director of defense information at the Pentagon. Stealth E-mail also is used extensively by Russian criminals, often former KGB agents.

"This method of communication is a favorite for engaging the services of cybercriminals and for authorizing payment for their acts through a third party," Strassmann said.

Its reputation precedes it

Perhaps the best-known remailer site is in Finland at anon.penet.fi (see chart below).

The Finnish server was used last year to publish confidential and copyrighted scriptures from the Church of Scientology. It also was used to reveal the secret source code used by RSA Data Security, Inc. in some of its encryption products.

Last year, police raided the Finnish site and seized records and computer gear as part of an investigation of alleged copyright infringement.

The administrator of anon.penet.fi offers this warning to new users: "I believe very firmly that it's not for me to dictate how other people ought to behave. But remember, anonymous postings are a privilege, and use them accordingly. Remember, this is a service that some people [who use newsgroups] such as alt.sexual.abuse.recovery need. Please don't do anything stupid that would force me to close down the service."

One remailer advertises itself as a way to thwart attempts by intelligence agencies to trace illegal traffic, Strassmann said. It holds all incoming messages until five minutes after the hour, then remails them in random order. The messages are sent through five to 20 other remailers, with a stop in at least one of the several countries noted for lax law enforcement, he said.

Yet other experts say the threat from remailers is greatly exaggerated. "We've had remailers around for a while, and society hasn't fallen," said Mike Godwin, staff counsel at the Electronic Frontier Foundation in San Francisco. "We've had anonymous communications in the U.S. for years; you can use a public telephone, send a letter without a return address or engage in a cash transaction."

Last year, the U.S. Supreme Court struck down an Ohio law that required the authors of political posters and pamphlets to identify themselves. "In the case of political speech, you can't make people tell you who they are," said Patrick Sullivan, executive director of the Computer Ethics Institute in Washington.

But Sullivan said the police raid on the Finnish remailer was prompted by the Church of Scientology's legitimate complaint about violations of copyright law.

"I haven't heard many uses of remailers that haven't involved, at the very least, being disrespectful and, at the most, trying to cause harm of some sort," he said.

Do's and don'ts

Unethical or illegal uses of anonymous remailers:	Legitimate uses of anonymous remailers:
To spread viruses or other malicious software	For "whistle blowing"
To harass or commit libel	For political speech
To violate copyright laws	For encouraging frank but constructive exchanges of opinions
To encourage others to commit unethical or illegal behavior	

How to use an anonymous remailer

1. Send E-mail to **help@anon.penet.fi**, and you will get back a help file.
2. Send E-mail to **ping@anon.penet.fi**, where you will be assigned a unique E-mail address. You will be anXXXXXX@anon.penet.fi, where XXXXXX is your confidential identification number. You can now use this address as you would your normal E-mail address.

Battle against remailers an unfair fight

Think of anonymous remailers as enemies you can't fight face-to-face, says Paul Strassmann, former director of defense information at the Pentagon and now a lecturer at the U.S. Military Academy at West Point.

"Anonymous remailers are here to stay," he said. "That means the old military paradigm of retaliation falls apart. The whole theory of warfare has been if someone attacks you, you can attack them. But when you are anonymous, there is no one to shoot at."

Strassmann said society must look for defenses in the health sciences, not among electronic technologies.

"The history of public health teaches us that suppression of any disease must be preceded by a thorough understanding of its behavior, its method of transmission and how it creates its own ecology," he said.

"As in the case of smallpox, yellow fever, flu epidemics, AIDS or malaria, it will take disasters before the public may accept that some forms of restrictions on the electronic freedom of speech and [that] privacy may be worthwhile."

— Gary H. Anthes

Web tools give sites more graphics pizzazz

By Mitch Wagner

Three vendors have rolled out tools that let World Wide Web authors build jazzier and more professional sites by expanding the range of graphics available and tying sites to existing corporate applications.

These tools are the following:

- **Texture** is a Java-based package from FutureTense, Inc. in Concord, Mass. Texture lets developers build Web sites that have customizable fonts and escape the rigid graphical layout requirements of conventional Web pages.

Development tools

- **Hahtsite** from HAHT Software, Inc. in Raleigh, N.C., combines programming tools, a WYSIWYG graphics editor, database access interfaces and management tools for a complete Web access package.
- **WebC** from MaxInfo, Inc. in San Francisco allows users to build applications in C or C++ that run with a Web front end.

Tools that provide advanced Web graphics and integrate the Web with other enterprise applications are "going to be pretty hot," said Lela Armstrong, a senior systems coordinator at Indianapolis Power & Light Co. in Indianapolis. "We need something that will allow us to provide links between our own applications and the external Internet," she said.

Product particulars

FutureTense's Texture allows developers to use a point-and-shoot interface to build applications in Sun Microsystems, Inc.'s Java language that get around the limitations of Hypertext Markup Language (HTML), the current standard language for building Web applications.

Web designers will be able to specify different kinds of fonts for their pages, use different backgrounds on different parts of a page and lay out graphics at any spot on the page. These tasks can be done in a limited fashion and with great difficulty with current Web technology.

Documents created with Texture can be viewed with any Java-enabled browser, including Netscape Communications Corp.'s Navigator, Microsoft Corp.'s Explorer and Spyglass, Inc.'s Mosaic. Texture will ship in the second quarter for $495.

Hahtsite from HAHT Software includes a Microsoft Visual Basic programming environment with debugger, support for Java applets and database access provided by an Open Database Connectivity interface. The software will be released in the second quarter and costs $695.

WebC from MaxInfo was designed to provide developers with an easy way to build Web sites that are customized on the fly. Rather than store static HTML pages, developers will be able to store data and programs and generate customized HTML pages as users request them. Many Web sites offer this capability, including the Internet Shopping Network and Industry.Net, but those sites used custom-developed software.

WebC generates source code that can be compiled using standard C and C++ tools. The software is available now for $399.

Brief

Cisco bundles browsers

Cisco Systems, Inc. in San Jose, Calif., has begun bundling World Wide Web browsers from **Netscape Communications Corp.** with its Internet Junction Internet gateway products. The gateways connect Novell, Inc. NetWare clients to any network running TCP/IP, the Internet's primary protocol. A five-user license costs $595.

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New Products

Decisive Technology Corp. has introduced Decisive Survey, Internet survey software.

According to the Palo Alto, Calif., company, Decisive Survey lets users send electronic questionnaires and surveys to World Wide Web site visitors. It was designed to give users a means to collect, review and analyze visitor and customer information and qualify prospects for future contact.

The product supports surveys with as many as 10,000 respondents and features filtering capabilities that let users sort and organize collected responses. Decisive Survey provides full support for authoring and deploying surveys under Windows 95, Windows NT and Windows 3.x.

Pricing for Decisive Survey starts at $495 for the 100-respondent version. A free, 10-respondent version can be downloaded from http://www.decisive.com.

▶ *Decisive Technology*
(415) 528-4300

Sams.net, a division of Macmillan Computer Publishing, has introduced Internet Madness, a collection of Internet utilities.

According to the Indianapolis company, Internet Madness is a 300M-byte collection of shareware and freeware utilities, including more than 100 Internet tools, on-line books and movie files that help users find helpful software utilities. It was organized as a multimedia browser and has brief descriptions of each product with documentation and upgrade information.

Internet Madness requires an Intel Corp. I486-compatible PC with a CD-ROM player, a hard disk with 10M bytes of available space and 8M bytes of RAM.

Internet Madness costs $30.

▶ *Sams.net*
(317) 581-3500

Internet Security Systems has rolled out Internet Scanner 3.2, a Unix-based network security scanning product.

According to the Norcross, Ga., company Internet Scanner 3.2 learns an organization's network and probes each network device with an IP address for security holes. It lets organizations test for more than 130 security vulnerabilities, including the Microsoft File Sharing bug, the TelnetD bug, the Stealth Scan and Finger Bomb.

Internet Scanner 3.2 includes reporting capabilities with hyperlinks that connect to advisories and World Wide Web vendor sites for information regarding network holes. It supports Linux to allow scanning from a laptop PC.

Pricing for Internet Scanner 3.2 starts at $795 for a 10-device network.

▶ *Internet Security Systems*
(770) 441-2531

Mercury Interactive Corp. has introduced WebTest, an automated testing tool for the World Wide Web.

The Sunnyvale, Calif., firm said WebTest helps organizations improve the quality of a Web system by letting developers measure response time to a browser request, determine the maximum number of hits the server can support and measure the system's ability under varying conditions.

WebTest works with Mercury Interactive's WinRunner, LoadRunner and XRunner. Developers use these products to create a test script of user interactions with the browser. WebTest then simulates thousands of Hypertext Markup Language hits against the server.

Pricing for WebTest starts at $195.

▶ *Mercury Interactive*
(408) 523-9900

Novell, Inc. has announced GroupWise WebAccess, a product for collaborative communication and information coordination over the Internet.

According to the Orem, Utah, company, GroupWise WebAccess lets users schedule group meetings, listen to voice mail, retrieve documents, send Internet electronic mail, view faxes and read attachments from any workstation with an Internet connection and a Hypertext Markup Language 1.0-compliant Web browser.

The product was designed to let remote users stay connected to a home office, a corporate Internet and a company internal messaging/communications system when traveling.

Pricing starts at $249 for a 10-user pack.

▶ *Novell*
(801) 429-7000

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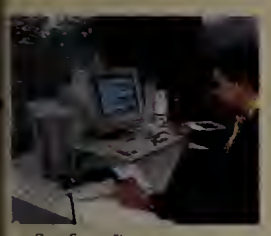

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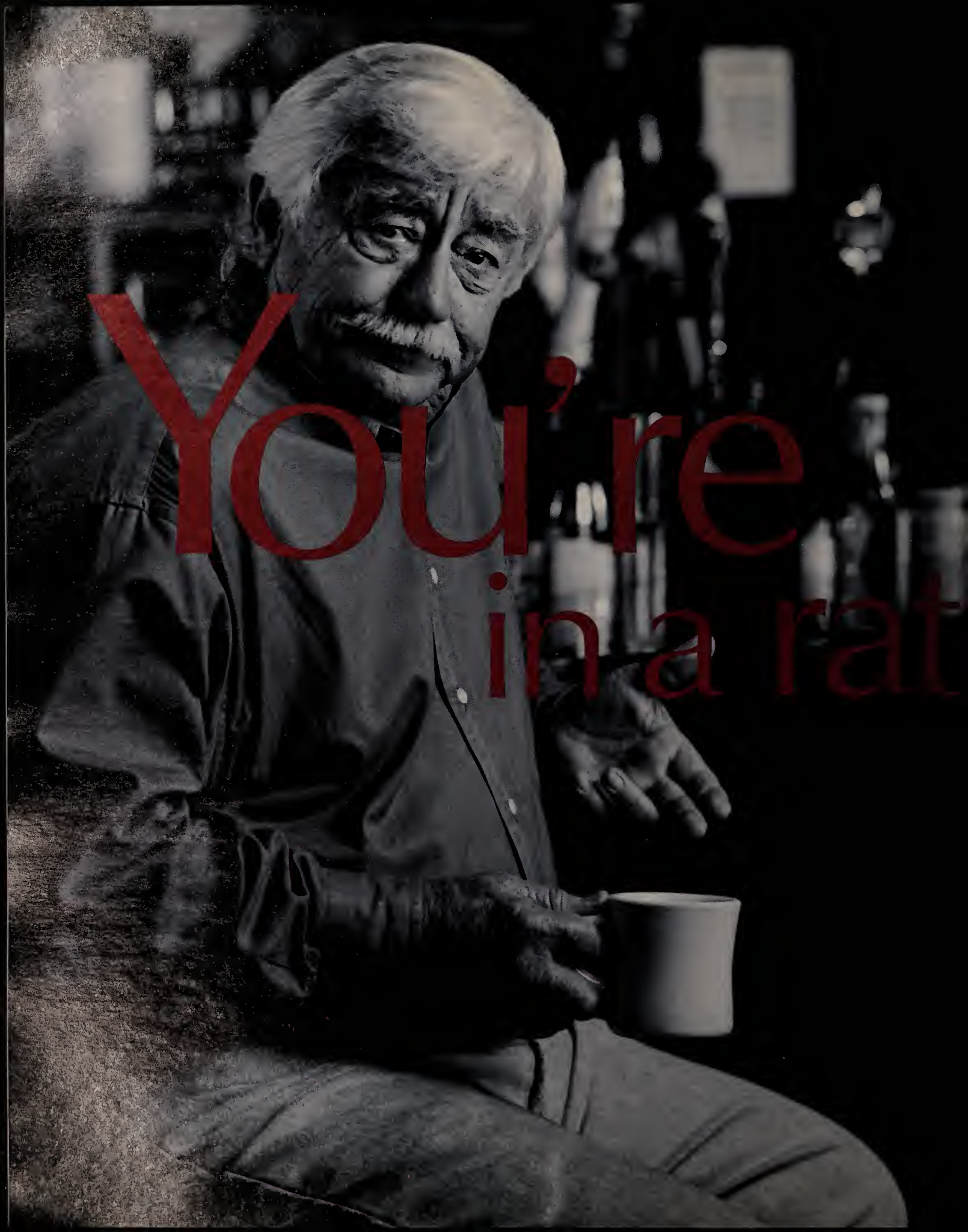
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He explained how he thought that one day, people everywhere would wear athletic shoes all the time. For all kinds of things. And he showed me some drawings of shoes, with the oddest looking logo I'd ever seen.

"Sounds very interesting," I said, trying not to sound too patronizing. "But new things tend to make me nervous." And with that, I excused myself.

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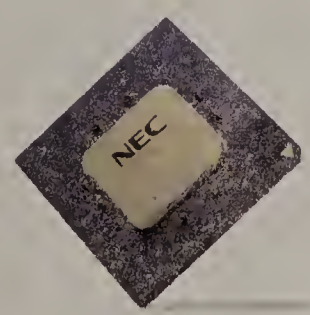

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CASE STUDIES • TRENDS • OUTSOURCING

Preventive maintenance

Health provider signs up Entex to deliver life-cycle PC support

By Tim Ouellette

Health provider United Wisconsin Services, Inc. (UWSI) is putting its PC support on a managed-care plan.

Under an unusual contractual arrangement, UWSI in Milwaukee is outsourcing full life-cycle support of its almost 1,200 desktop PCs for a fixed price per desktop. The company wouldn't reveal pricing under the three-year, multimillion-dollar contract.

Outsourcing

UWSI, which previously outsourced its support on a pay-as-you-go basis, will gain the assurance that desktop support won't exceed a specified cost per PC over the period of the contract. The company will be able to control spending, improve its budget planning and receive better service than before.

"We wanted to be in a position where we could [more accurately] predict what the total desktop support costs will be," said Darrell Williams, director of technology at UWSI.

The fixed-cost approach is unusual. "I don't think it is happening in more than 20% of outsourcing deals," said Tim Bourgeois, an analyst at International Data Corp. in Framingham, Mass.

The normal practice in the outsourced support industry is to sign a time-and-materials service contract. Under this arrangement, a company typically pays for service as problems arise. Trying to estimate the cost of such a contract is like trying to predict how much it will snow in the winter when preparing a snow-plowing budget in the summer.

Support costs

According to Gartner Group, Inc. in Stamford, Conn., almost 80% of the total cost of a PC goes to support. This includes tracking the hardware and software inventory, updating software and providing technical support, as well as user downtime. Gartner also estimates that for every 25 PCs installed, one full-time support employee is required.

"More and more customers are asking for this type of contract as support costs become harder to control and estimate. UWSI will probably grow in their PC usage in the next couple of years — and they can grow at a fixed price," said Tim Ancona, branch manager at the Milwaukee office of Entex Information Systems. Entex is based in Rye Brook, N.Y., and is UWSI's support contractor.

The contract gives UWSI, an affiliate of Blue Cross & Blue Shield United of Wisconsin, complete desktop support — from acquisition of hardware and shrink-wrapped software to ongoing support and maintenance to managing office moves. The contract doesn't cover LAN support, but UWSI is considering going to a similar contract for such support in the future, Williams said.

A major feature of the managed-care approach is that UWSI will know exactly how long it will take Entex to answer a call and work on a problem. And rewards are built in to the contract based on parameters such as response time and general quality of service.

So Entex will have an incentive to provide preventive care to other PCs whenever it responds to a user call, Williams said. Under traditional service deals, vendors are paid for their visits to the site to fix a problem, so they don't care how many times they have to return. But the managed-care format puts the burden on Entex to cut costs and make sure things run smoothly at UWSI.

Other outsourcing service providers, including Digital Equipment Corp. and Electronic Data Systems Corp., offer similar options for clients, Bourgeois said. The format often is offered as a last resort to win a contract because contractors are working out the kinks in performing these deals profitably, he said.

More choices

Another twist in the Entex contract is that each of UWSI's business units can choose the managed-care approach or the traditional pay-as-you-go support, said Jay Fisher, a principal at Millennium Partners, Inc., a Milwaukee consultancy that worked with UWSI to develop the contract format.

The traditional plan may be more practical for groups with few computer resources. But users who choose the managed-care plan receive priority on service calls.

A prescription for cutting support costs

United Wisconsin's flat rate managed-care approach to outsourcing desktop support will provide the following:

- **Rx** One fixed price per desktop
- **Rx** Control over PC support costs and ability to prepare future budgets
- **Rx** Incentive for service providers to perform preventive maintenance during a service call. Service providers are rewarded for keeping support costs down.
- **Rx** Reduced administration costs. The service provider manages all life-cycle support, from buying PCs and software to tracking PCs when employees switch offices.

Target: reduce computing expenses

Northrop Grumman merger sets sights on 25%-30% IS savings

By Thomas Hoffman

Northrop Grumman Corp.'s top brass gave its information systems organization a target to reduce expenditures by $40 million in 1995.

By moving quickly to downsize staff, consolidate systems and adopt industry standards, the IS unit was able to shatter that mark and save $75 million last year.

Northrop Grumman's Jim McCann: *The reduction in jobs had to be made quickly*

Tenacity

"That's a testament to the dedication of the people we have here," said Jim McCann, vice president of IS services at the Los Angeles firm. "They've been pretty amazing, given the reductions we've taken in the data centers and such — we're still working 15, 16 hours a day to get it done."

Since the merger in 1994 of Northrop Corp. and Grumman Corp., Northrop Grumman has whittled six U.S. data centers into three. The company, which acquired Vought Aircraft Co. in 1994, has also saved money by consolidating a complex of Amdahl Corp. mainframes into an IBM ES/9000 machine at a Northrop facility in Hawthorne, Calif.

But the bulk of the savings came from eliminating 140 data center positions. Before the merger, the companies employed 2,300 IS people; that figure has since been pruned to 1,900. "In any merger situation, people are nervous" about job security, McCann said. "That's why we wanted to take those reductions as quickly as we could."

On the technology side, Northrop Grumman's systems unit first needed to cobble together each company's electronic-mail and video-conferencing systems to facilitate communications among staff members in more than 100 offices across 16 states and foreign countries.

Using SoftSwitch, Inc. gateways, Northrop Grumman has linked Grumman's Microsoft Corp. Mail users to Northrop's Lotus Development Corp. CC:Mail users. McCann said the firm plans to move approximately 20,000 users to Microsoft's Exchange system by the end of the year.

"The gateways worked out OK as a temporary fix, but you end up having problems with multiple messages going across the network and creating excess traffic," McCann said.

Setting standards

The firm, with estimated sales of $6.8 billion last year, also plans to stabilize its wide-area network infrastructure this year. To that end, it will standardize on Cisco Systems, Inc. routers and SynOptics Communications, Inc. hubs. The two-year, $15 million effort was launched late last year.

"We had every type of router and hub on the market," McCann said. The standardization effort is expected to help Northrop Grumman reduce its network equipment maintenance and

Merger savings, *page 64*

Briefs

Disaster recovery team adds member

Ontrack Data Recovery has joined The Chubb Alliance, a group of disaster recovery firms that assess, plan and implement disaster recovery strategies for federal, corporate and private clientele. Members include DataShred, Iron Mountain and Palindrome Corp.

SAP tapped in Mexico

Volkswagen of Mexico has signed a deal with SAP AG to use the vendor's R/3 client/server software at its manufacturing facility in Puebla, Mexico. Volkswagen will implement R/3's production planning, warehouse management, plant maintenance and purchasing modules at the plant, which is expected to produce 340,000 cars annually by 1998. Volkswagen's in-house consulting division, Gedas, will handle implementation of the system, which 1,500 users eventually will access.

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Merger savings at Northrop Grumman

CONTINUED FROM PAGE 63

support costs by 25% to 30%.

Also started late last year was a five-year effort to standardize 25,000 PCs worldwide on Windows 95 client software. Northrop Grumman will link those users by using the Windows NT network operating system, "since we already had so many [Microsoft] Office products and were moving to Mail and Exchange anyway," McCann said.

As the firm has expanded its client/server enterprise, the demand for network and systems administrators has outstripped the supply. To help handle that labor shortage, Northrop Grumman is recruiting more college graduates and hiring more contract labor.

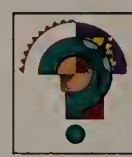
United they stand

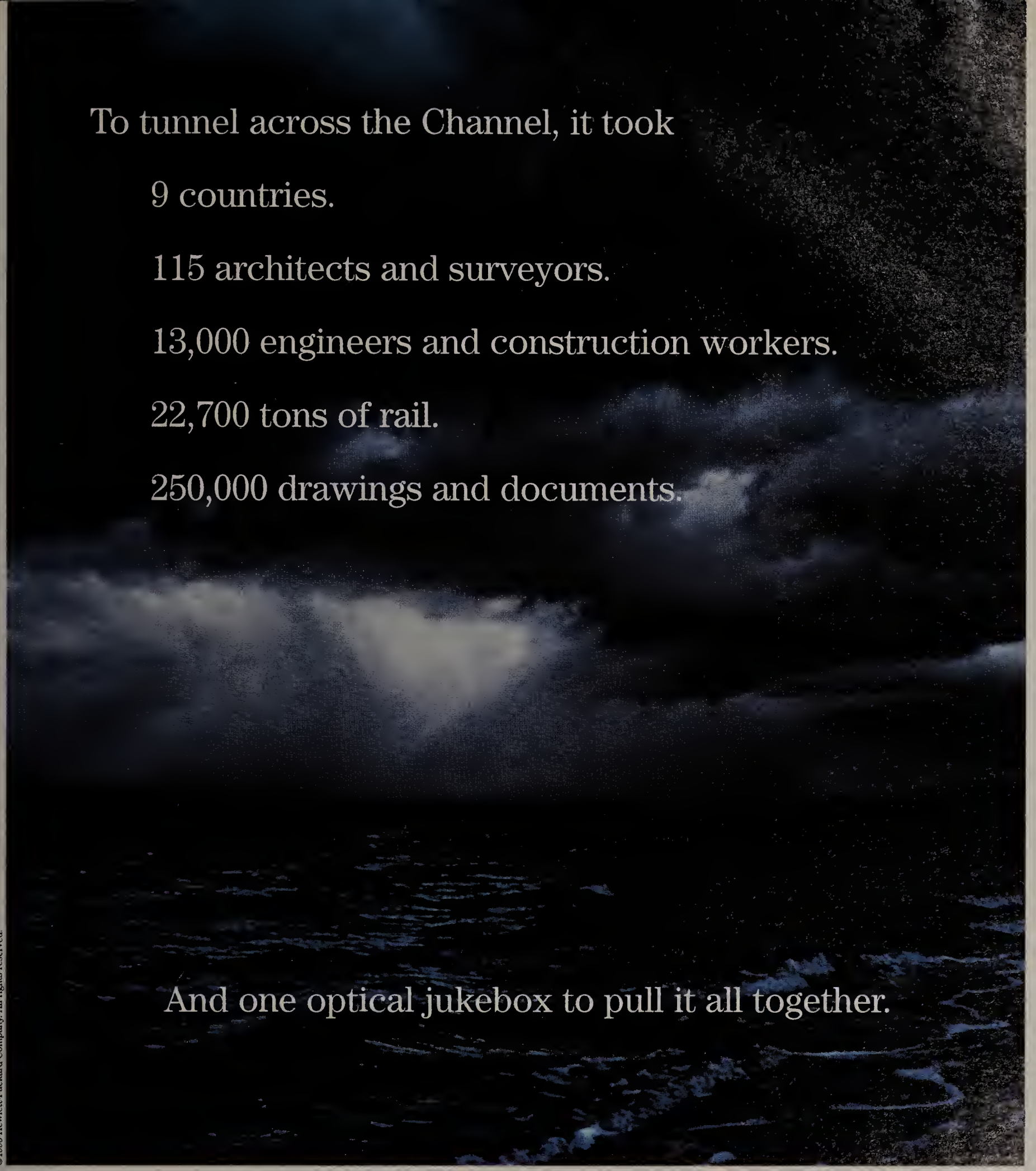
Sweeping cuts to the U.S. defense arsenal in the 1990s and cost pressures on commercial airlines have led to consolidation and shakeout in the defense and aerospace industry.

So perhaps it was fortuitous that Northrop and Grumman began their independent assaults on the federal systems integration market before they got hitched in May 1994. No doubt the combined firm will be able to carry its own systems consolidation lessons into the marketplace.

"It's too soon to tell how the [Northrop Grumman] merger will turn out," said Paul Strassmann, who was chief information officer at the Department of Defense until 1993.

However, the "hemorrhage of talent" lost through downsizing over the past few years will force the federal government to "increasingly look to [systems integrators such as Northrop Grumman] to provide a wide range of technology services," Strassmann said. He is now an independent consultant in New Canaan, Conn. — *Thomas Hoffman*


Serial Line Internet Protocol



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▶ IS DELIVERS FOR CONTRACT LOGISTICS FIRMS. TURN TO PAGE 70.

Managing

TELECOMMUTING.

Managed well, it's a big win for IS departments. But not all workers can handle it, and sometimes there's no substitute for face-to-face communication.

By Leslie Goff

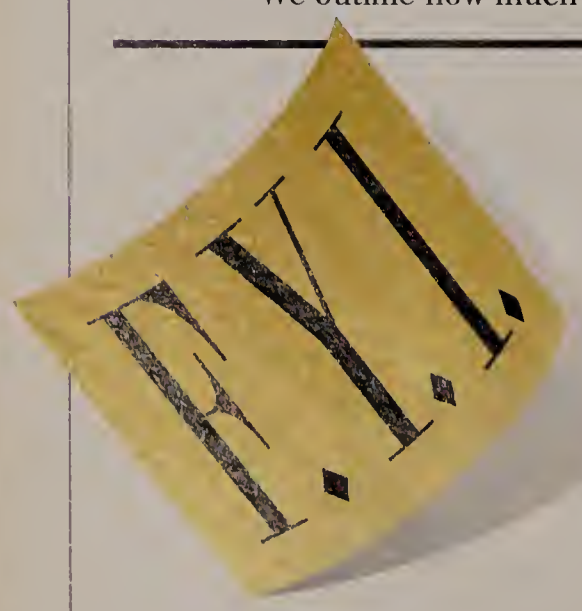
Offering workers the opportunity to telecommute can increase retention, enhance recruiting, create greater loyalty and boost productivity. But to make it work, information systems managers must learn new supervisory techniques. No longer can they peer over cubicle walls to see who's spending too much time at the coffee machine.

At companies with strong telecommuting programs, managers and project teams work together to set specific policy about who's eligible, when and what work employees can do at home.

"We outline how much time we think a project should take, assign it to a single person and have them do it all — from the analysis to the programming," says Bard White, chief information officer and director of worldwide IS at Spalding Sports Worldwide in Chicopee, Mass. "Then we measure performance in due dates, not by how many lines of code are written."

Spalding began a telecommuting arrangement as part of its strategy to keep the company's global systems up 24 hours a day. Now support staff can take care of overnight problems in their pajamas. About 20 telecommuters — 30% of the IS staff — work at home from one to three days per week.

Guy Edwards is vice president of IS at Provident Mutual Life In-



Systems development surprise

Software development managers and team leaders, lend us your eyes. Have we got a kick in the keister of conventional wisdom for you.

P. J. Guinan, an assistant professor at the Boston University School of Management, recently finished a four-year, $1.5 million study of high-performance software development teams. She scrutinized 68 development projects at 15 Fortune 500 companies, from their start to six months after the systems were delivered. Guinan and a team of researchers uncovered some common practices that ought to be deep-sixed.

- "Heavy managerial involvement is the most important enabler and predictor of success," Guinan says. If you're looking for vindication of your strong, hands-on leadership style, smile. She found that software development team leaders do well at creating cohesive teams, keeping them on track and persuading outsiders to support the project.

But companies are full of uncooperative users, skeptical managers and other potential project-wreckers. Part of your job is to protect your team from those pressures. You need to keep a tight rein on information about your project and insulate your team members from corporate politics so they can focus on their jobs. Right?

Wrong, wrong, wrong. The study found that this kind of buffering hurts, rather than helps, the team — particularly at the early stages of systems development. With user involvement so critical to the success of cross-functional systems, keeping important information secret creates damage, not damage control.

- Do you staff your development teams with a mix of experienced veterans and less-experienced de-

Do these findings surprise you or are they all too true? Starting Feb. 12, Jay Cooprider is hosting a whiteboard on "@Computerworld," our Web site. The address is http://www.computerworld.com. Drop in, sound off and find out what other IS managers are saying.

surance Co. in Philadelphia, where seven programmers telecommute one or two days per week. He says evaluating a developer who telecommutes should be no different from evaluating one who's in the office full time. "You're looking at their ability to produce the programs and modules they've been assigned, and that doesn't change."

But what about accountability? How do managers forgo those coffee-machine reconnaissance missions?

If an IS employee at Spalding can't maintain deadlines and work without direct supervision, White says he revokes the telecommuting privilege.

Timing is important, too. Certain project phases lend themselves better to telecommuting than others. Beth Lange, a researcher at Andersen Consulting's human integration lab in Northbrook, Ill., says, "You need different levels of interaction among team members and users in different phases. In the beginning, when you're setting the scope and planning the project, you need a lot of face-to-face communication."

Edwards agrees. "My staff knows that at the beginning of a new project, they need to be here every day."

In other phases, such as the creative work of programming or the technical work of compiling and debugging, team members can benefit from working at home.

This brings up a major difficulty for managers and employees: Even formal telecommuting arrangements may have to be managed in an ad hoc fashion. Most IS organizations insist on flexibility.

The Cobol-oriented IS environment of 20 years ago may have been better suited for telecommuting than today's IS shop with its interdisciplinary project teams. But today's labor market is forcing IS departments to examine telecommuting. Managed well, it has more benefits than drawbacks.

But White has a final warning for managers. "Telecommuting is not for every environment," he says. "There must be trust, and short-term deliverables must be in place or you can really get someone taking advantage of you." ■

Goff is a freelance writer in New York.

IS telecommuting on hold

Just because IS jobs are computer-centric, don't assume telecommuting will work for your organization.

It's a common misperception, according to Cynthia Ruppel, assistant professor at the University of Toledo's Information Systems and Operations Management Department in Toledo, Ohio. "A lot of the literature has suggested [that] IS jobs are ideal for telecommuting because they are computer-based. And, presumably, anything you can do at the office, you can do at home," Ruppel says. "But in today's environment, that's a simplistic view."

"Things in IS are different than in the days of writing lines and lines and lines of code," she adds. "Today we are more into software engineering and working closely with users."

Ruppel and Susan J. Harrington, associate professor of IS at Georgia College in Milledgeville, co-wrote the paper, "Telework: An Innovation Where Nobody Is Getting on the Bandwagon?," a study on telecommuting practices among IS professionals at 252 companies.

Another misperception is that telecommuting is rampant in IS organizations. In the study, 48% of the organizations that responded said they support telecommuting in IS. But even among these early adopters, the arrangements are largely informal, ad hoc programs.

– *Leslie Goff*

AVERAGE FREQUENCY OF TELECOMMUTING AT COMPANIES THAT ALLOW IT

Percentage of staff who . . .

Never telecommute	73.4%
Occasionally telecommute	15%
Telecommute equivalent of one day per week	3.9%
Telecommute two to four days per week	3.9%
Telecommute five days per week	3.8%

Base: 252 IS organizations

Source: Telework: An Innovation Where Nobody Is Getting on the Bandwagon? by Cynthia Ruppel and Susan J. Harrington

TELECOMMUTING RESOURCES

■ **The Smart Valley Telecommuting Guide**
http://smartone.svi.org/PROJECTS/TCOMMUTE/TCGUIDE/
A full on-line book, ready to download or print, that guides managers through the whys, wherefores, obstacles and solutions of telecommuting. It was written by Eric Benhamou, president and CEO of 3Com Corp., and Harry J. Saal, president and CEO of Smart Valley, Inc.

■ **Telecommuting '96**
http://www.cba.uga.edu/tc96/
Information is available about this conference to be held April 25-26 in Jacksonville, Fla., and users can access papers to be presented.

■ **Telecommuting, Teleworking and Alternative Officing**
http://www.gilgordon.com/
This site has a good frequently asked questions sheet on telecommuting from manager and employee perspectives.

■ **Telecommute America!**
http://www.att.com/Telecommute_America/
Link to dozens of other sites that deal with telecommuting and download news releases and other information to support your business case for telecommuting.

velopers? Figure the graybeards will teach, even mentor, the newcomers? Think your teams are learning organizations?

Not likely.

Guinan found, to her surprise, that teams made up of developers with the same level of experience perform better than teams in which there's a mix of experience. It's actually better to have teams of relatively inexperienced people than heterogeneous teams.

The reason: Your old pros just don't have the time to teach the newbies. They're too busy trying to meet your aggressive deadlines. The same goes for mentoring. There's no time or incentive to show the new guys the ropes.

The study, led by Guinan with help from Jay G. Cooprider, an assistant professor at the University of Texas in Austin, was funded by IBM and The Boeing Co. — *Allan E. Alter*

@

Talkback@cw.com

Editors: I recently read your article on training [CW, Nov. 27]. In every company I have worked for, internal training was paid lip service but was usually relegated to a few manuals put out by human resources.

The obvious exception is customer training! When the customer can be charged, empires are built and profit centers abound.

If an information systems director can't find good instructors, the blame falls on senior management. When instructors can get paid better teaching fourth grade than teaching programming or systems design, there is little incentive to pursue such a career.

George T. Hilliker
Richmond, Texas
71043.1023@compuserve.com

Not so fast!

IS professionals are reluctant to divulge credit-card numbers on the World Wide Web. If techies lack confidence in Web security, will consumers get nervous, too?

Statement read to respondents: "I feel comfortable releasing a credit-card number on the Web."

Completely disagree or disagree	83%
Neither agree nor disagree	9%
Agree or completely agree	8%

Source: "@Computerworld" survey of 202 IS professionals and managers

F.Y.I., *page 74*

Haulin'

Contract logistics, already a $25 billion business, could double by the year 2000. Here's how three IS executives and their departments are responding to this booming opportunity.

By Brian McWilliams

Big companies love selling widgets. But they hate shipping and storing and tracking their widgets. They hate it so much that nearly one-third of the Fortune 500 have outsourced these logistics needs.

But what's poison to big manufacturers and retailers is meat to the burgeoning contract logistics industry. Elbowing for a piece of this $25 billion market are motor carriers, warehouse firms and air express companies.

Assets such as trucks, warehouses and planes, however, don't win logistics contracts — information management does. And information systems plays a huge role in the logistics business.

As companies such as Ryder Dedicated Logistics, FedEx Corp. and United Parcel Service, Inc. spawn logistics subsidiaries and chase lucrative contracts from the likes of Motorola, Inc., General Motors Corp. and Dell Computer Corp., the pressure is on IS to deliver custom systems under demanding timetables.

For the industry's IS executives, it's a rare opportunity for entrepreneurialism. But the pace is withering. The technical and people challenges are formidable, and the penalties for botching things up are severe. Three IS executives tell how they handle the challenges.

HENRY FIALLO
Vice president of IS, Ryder Dedicated Logistics (RDL), Miaml

Revenue from logistics (estimated 1995): $1 billion
Major customers: General Motors, Xerox Corp., General Electric Co., Whirlpool Corp.
Biggest challenge: People

Some IS managers struggle to prove the business benefits of technology. Not Henry Fiallo. "Our chairman [Tony Burns] told me we have first call on capital," he says. "The future of this company is logistics."

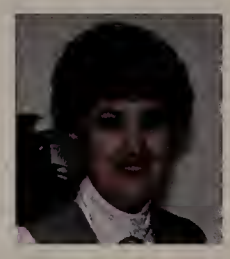
Fiallo was named to the top IS post at RDL last January, after eight years at parent company Ryder Systems. There he helped lead the vehicle leasing company's IS architecture efforts. That experience serves him well in his new post as RDL attempts to put its house of functionally based logistics applications in order.

But people, not systems, are Fiallo's most pressing concern. "Information technology is a front-line sales function in this company," he says.

That means RDL must hire IS staffers who are skilled not only in logistics systems, but also in understanding customer requirements and translating them into functionality. Finding such individuals in today's job market is difficult, yet Fiallo must quickly beef up his 100-person staff by at least 60 to cope with new business. To do this, he relies heavily on body shops and is even recruiting contractors from overseas.

Once on board, IS staffers are assigned by Fiallo to dedicated customer teams made up of experts in areas such as electronic data interchange, warehousing, just-in-time manufacturing and mathematics. The size of these brain trusts varies, depending on the contract. RDL's team for OfficeMax, Inc., for example, has two dozen members, while the team for General Motor's Saturn Motor Corp. has close to 50.

KATHY WISE
Director of marketing information systems, Roadway Logistics Services, Inc., Akron, Ohio



Revenue from logistics (1994): $400 million
Major customers: Dell Computer, Deere & Co., Hewlett-Packard Co.
Biggest challenge: Getting customers to share vital information

Kathy Wise spends at least 25% of her time in front of customers. Her boss is the vice president of marketing and sales. And her quarterly bonus depends on how well she meets objectives set by customers. But she says the hardest thing about launching Roadway's logistics business is getting close enough to customers.

"One of the toughest parts of my job is breaking down communication barriers and convincing customers that information-sharing is in their best interest," Wise says. She joined Roadway Logistics in 1991.

To develop an optimal supply chain strategy for Roadway customers, Wise says she needs access to sensitive data such as potential suppliers, production schedules and strategy. But even when the walls come down and customers treat Roadway as a strategic partner, such vital information may be elusive. Many customers have never precisely tracked shipping costs or packaging information, for example. Yet "everything builds from that," Wise says. In fact, Roadway has sent people into a customer's warehouse to measure cartons.

To support customers' just-in-time manufacturing operations, Roadway must continually reinvest in information technology. Wise says the company expects to dedicate nearly 60% of its infrastructure spending this year to information technology.

Relying on a combination of off-the-shelf and homegrown logistics applications, Roadway's staff of 200 puts most of its efforts into writing custom front and back ends for the firm's suite of logistics applications. This lets IS remain flexible to changing customer demands.

JEFF RAKOWSKI
Vice president of information technology, UPS Worldwide Logistics, Atlanta

Revenue from logistics (estimated 1995): $300 million
Major customers: Gateway 2000, Inc., Rolls-Royce PLC, Motorola
Biggest challenge: Managing the virtual corporation

Jeff Rakowski is playing catch-up. When UPS launched its logistics subsidiary in 1992, it misread the market, he says. "UPS was used to thinking of information as a cost of doing business, not the primary service," says Rakowski, one of the division's founding managers. "So our concern when we started [UPS Worldwide Logistics] was assets, not information systems."

Not surprisingly, Rakowski inherited few systems from the parent company. He has since bought and integrated packages from vendors such as American Software, Inc. in Atlanta for inventory management and Fritz Companies, Inc. in San Francisco for transportation management.

But the larger issue remains: individualizing applications for new customers as contracts come in. "Dates usually aren't negotiable," he says. "So you have to get something out there fast and go for iterative implementations."

Working with a full-time IS staff of only 30, Rakowski draws on an extensive network of technology suppliers, including more than 60 on-site consultants. "It's like being executive producer of a movie," he says. "My job is to assemble the best-of-breed, depending on whether we're making an action picture or an animated cartoon."

Convincing customers that they would benefit from dealing with such a virtual corporation is a challenge, he admits. So is ridding them of the perception that UPS and its trucks belong only at the end of the supply chain. But Rakowski is optimistic. Unlike some of the industries he has worked in, contract logistics offers a refreshing difference for IS executives: credibility. "Outside customers actually believe you when you say you can do something," he says. ■

McWilliams is a freelance writer in Durham, N.H.

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John Dodge

PC WEEK DEC. 18, 1995

CONTINUED FROM PAGE 69

Love, IS style

By Leslie Goff

Love seeketh not itself to please,
Nor for itself has any care;
But for another gives its ease,
And builds a Heaven in Hell's despair.

— William Blake

Can love bloom in that particular brand of Hell's despair otherwise known as IS? To mark the annual pagan ritual of love known as St. Valentine's Day, *Computerworld* found two couples who built their own private heaven over lunch.

Lisa + Michael

Lisa Sirlin, a senior technical analyst, and Michael Cullen, a network engineer, work at Turner Broadcasting Worldwide Information Technology Services in Los Angeles. They're wired in to each other. They have telephones, cellular phones, Apple Computer, Inc. Newtons, fax machines, modems and beepers. Between the two of them, they cover every area code in the Greater Los Angeles area.

They met last May on Cullen's first day at Turner's Hanna-Barbera, Inc. studios. "We'd heard we had this new whiz kid joining our group," Sirlin, 33, recalls, "so I certainly checked him out."

And Cullen says, "I thought, 'Wow, she's really cool.' But then I just got lost in getting my new job going."

Neither entertained thoughts of a relationship with a co-worker. But by the end of June, the two had bonded over a personal tragedy. When Sirlin learned a close friend had died, she says, "Michael showed his condolences in such a caring way. He took me to lunch and managed to make me laugh a few times and forget how I was feeling. That's when it all clicked for me."

Cullen agrees. "The day we went to lunch was the first real chance I had to share some personal thoughts. It was a turning point."

Electronic mail helped clinch the deal. Cullen began traveling frequently, and the two began an avid correspondence that continues to support the relationship. "We don't just write notes to each other, we write prose," Sirlin says.

They moved in together in December but stress that theirs is no whirlwind romance. "When you know it, you know it," Cullen says. "It's like chasing a problem: At the end, you see how easy it was to get there."

"When you see the end, the means is that much easier," Sirlin says.

Ed McDonald is an account manager at America's Work Exchange. Jane McDonald is a retired systems analyst. They live in Woodbridge, N.J. Both are 48. They met 10 years ago. Ed was a contract programmer, Jane a full-time analyst. One quiet Sunday afternoon at Salomon Brothers, Inc.'s data center, Ed recalls, "I had to take down the mainframe for operating system maintenance, and I was wandering around to see if anyone had any problems." He spotted Jane and the two struck up a long conversation.

Neither followed up for a while. Then one day they went to lunch, "and the rest is history," Jane quips. "Once we started dating, there wasn't any question that we'd get married." They married on a wedding cruise to Alaska.

Ed + Jane

Ed is an information systems consultant and placement specialist; Jane retired following IS cutbacks at Salomon Brothers but has worked with Ed in start-up ventures. Having shared a common career sustains the relationship, they say.

"We have totally different thought processes in some areas but in others, that very analytical IS-type mentality comes out in both of us. That's when we tend to agree on things." Ed says. "And we do a lot of mind reading."

Jane says, "We're completely on the same wavelength, and after all this time, that still amazes both of us."

IS Manager's Bookshelf

New books, videos and CD-ROMs

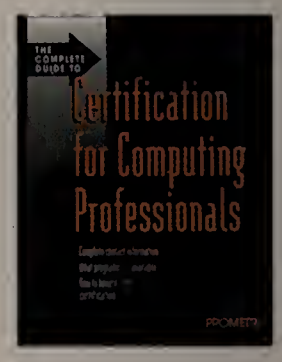
Rules of the Net: Online Operating Instructions for Human Beings
By Thomas Mandel and Gerard Van der Leun
(Hyperion, New York; 258 pages, $12, paperback)

Ever been flamed? Ever been spammed? Ever been flamed for spamming? Spammed for flaming?

It isn't easy to be a good net.citizen. This book helps and maintains a 'net news feel while doing so — not easy in hard copy. There's practical advice (don't send threatening mail to president@whitehouse.gov), but the book, like the best newsgroups, is limber, smart and funny.

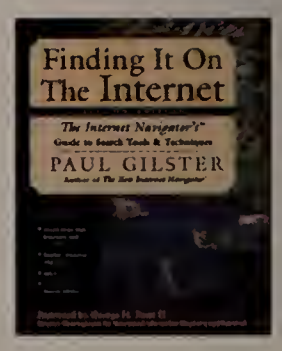
The focus is electronic mail; you won't find many tips on the World Wide Web. Nor will you advance your career. But you will have a ball, and you may spare yourself a long stint in alt.flame.

The Complete Guide to Certification for Computing Professionals
From Drake Prometric
(McGraw-Hill, Inc., New York; 292 pages, $39.95, hardcover)



A caveat: Drake Prometric is a testing and certification outfit. This book serves as a lengthy advertisement for the company's services and for certification in general. That said, though, there's a lot of rich data here that might be difficult to find in another single source. The book lists certification programs that are available for more than two dozen hardware, software and networking vendors. Impeccable writing, a clean layout and a strong index make it easy to find what you're looking for.

Finding It on the Internet: The Internet Navigator's Guide to Search Tools & Techniques (Second Edition)
By Paul Gilster
(John Wiley & Sons, Inc., New York; 379 pages, $24.95, paperback)



Do you drastically underuse the search capabilities of your Web browser? Have an uneasy feeling that your searches could be more specific and powerful, but you've never taken the time to read the documentation to get it right?

Same here. But now there's help. Gilster knows nuances of search engines — both popular and esoteric. His style sometimes lurches toward the academic, but the information's all there. This book will help you zero in on your targets.

Digital Cash: Commerce on the Net
By Peter Wayner
(AP Professional, Chestnut Hill, Mass.; 271 pages, $34.95, paperback)

This is a practical, dirt-under-the-fingernails guide to setting up electronic financial transactions. Wayner includes a DOS disk that you can use to actually transact on the Web, and many code samples are used as examples. It is also a sophisticated look at the future of commerce, with a great series of predictions on finance in the year 2010.

No joy in ISDN-ville

By Jim Volstad

The lure of a cheap ISDN line drew him in. Before he knew it, he had alienated his boss, his girlfriend and his cat.

Was the promise of 64K bit/sec. voice and data channels worth it?

When I discovered that an Integrated Services Digital Network (ISDN) line cost only $69 a month for 200 hours, I couldn't resist. I was moving to Minnesota to start my next computer consulting gig at a large retail company. I figured, why not change from my 28.8K bit/sec. connection at the same time? The thought of being able to use my telephone on one 64K bit/sec. channel and rocket through the Internet at 64K bit/sec. on the other left me giddy. I'm a technical guy, so it shouldn't be any more difficult to install an ISDN terminal adapter than a modem. Right?

Wrong. What started as a simple venture — one guy looking for one little ISDN setup — turned out to be a case of one vendor flub after another. And you wonder why ISDN hasn't caught on like wildfire at companies.

SEPT. 10, 1995: I'm in Detroit, finishing a consulting assignment. I order an ISDN line from US West Communications, Inc. I order a Motorola, Inc. Bitsurfr terminal adapter from a mail-order outfit called NECX, which I found on the Internet.

SEPT. 24: Arrive in Minneapolis to start my new assignment. Still waiting for the terminal adapter, but it doesn't matter because US West still hasn't installed my line and programmed the switch. I will be patient.

SEPT. 25: Call US West for installation date. They say "soon." Call NECX. Terminal adapters are on back order at Motorola factory. Oh well. Can't use one without a line anyway.

SECOND WEEK, OCTOBER: The line is in, but getting it to work is another thing. Call NECX about my Bitsurfr. Motorola product is still on back order — or so they tell me.

THIRD WEEK, OCTOBER: Still no terminal adapter. Factory orders are still backed up. Gee . . . there must be some pretty heavy demand for ISDN. I still believe what NECX tells me. Next day, some guy sells me the Brooklyn Bridge.

END OF OCTOBER: I need a blasted phone! My employer is nervous about my not having one. It's hard to support a client when I have to go to a pay phone every time I'm paged. I see an advertisement for a free cellular phone and get a good deal on service. For the first 90 days, non-prime-time calls are free. I still can't surf the Internet, but at least I can talk with the world. Feeding quarters to the pay phone gets old fast.

FIRST WEEK, NOVEMBER: Friends, family and my cat Byte think I'm nuts. "You're going to pay $110 for them to install an ISD-what?" I try to explain to them the joys of using two high-speed B channels. The service is cheap — the $69 includes my phone service — and it means I'll no longer tie up my phone when I'm pulling up Web sites or pulling down graphics. And let's face it: Technically, it's

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Volstad is a technical consultant who works on the Tandem Computers, Inc. platform. When he isn't working on a consulting assignment or drilling with his Army Reserve unit, he enjoys surfing the Internet with his shiny new ISDN line. He can be contacted at jvolstad@orbis.net.

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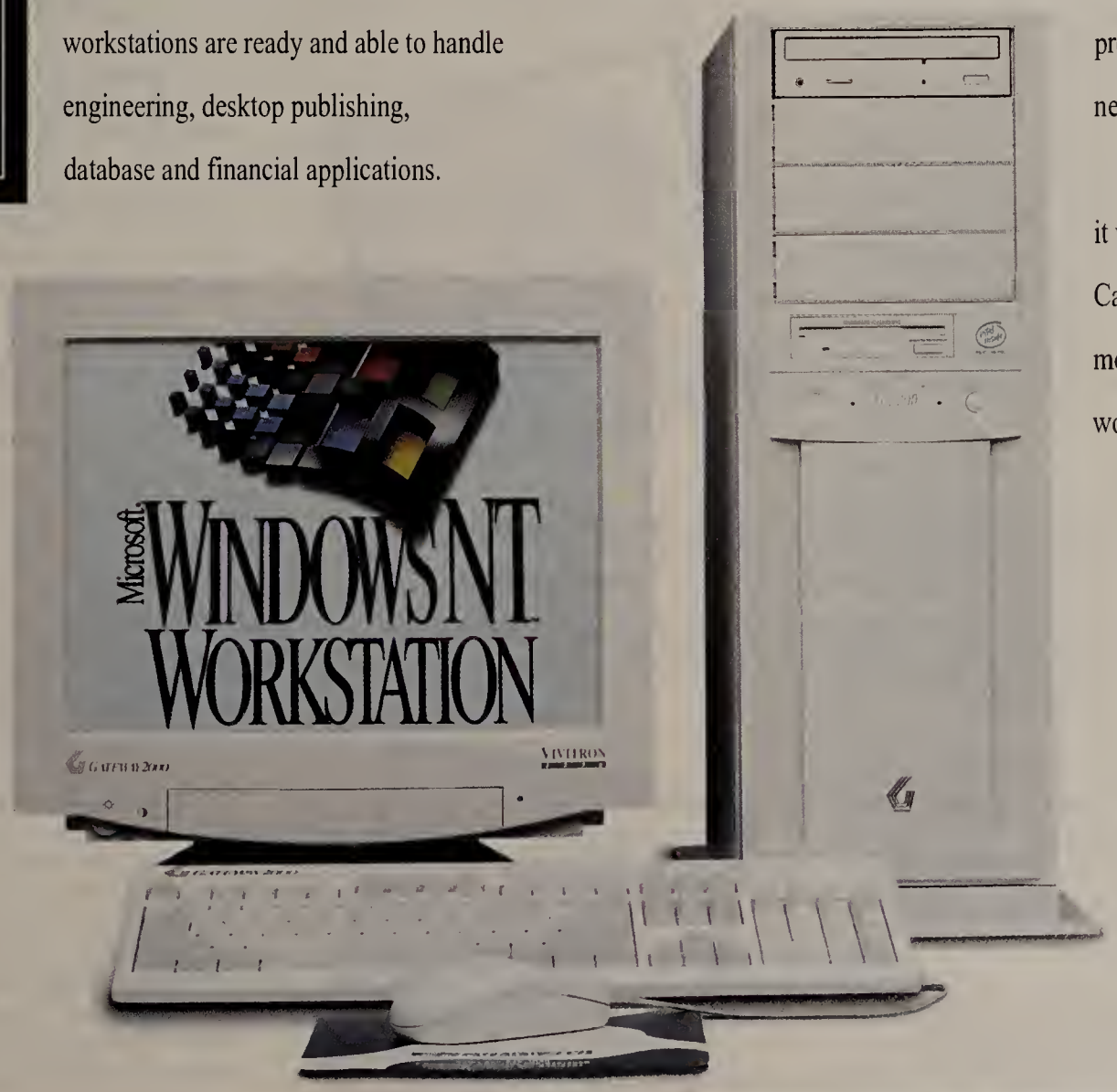

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ISDN-ville

CONTINUED FROM PAGE 75

cool. But my reasoning falls on deaf ears. The cat sneers at me but still accepts food.

SECOND WEEK, NOVEMBER: Still no terminal adapter. Does Motorola still exist? Are they sold out of Bitsurfrs? Are they making more? NECX keeps repeating the words, "Back order, back order." I keep a civil tone with the representatives, afraid they'll cancel my order and that I'll have to start at the bottom of someone else's Bitsurfr waiting list. I wonder if the cell phone is cooking my brains? ("What brains?" the nonbelievers ask.) But I'll have the last laugh when I'm surfing the 'net with one B channel and talking on the phone with the other.

NOV. 12: I'm bored. Tried plugging my phone in to the phone jack. Nothing. Big surprise: You can't use an analog phone with a digital line. Nothing ventured, nothing gained. The cat no longer lets me pet her, my employer questions my sanity, and my girlfriend won't call me on the cell phone. Sizzle sizzle. (That's the sound of my brains being cooked by my cell phone.) I have this deep-seated urge to chant, "B channel, B channel."

NOV. 13: Enough is enough. I call the Motorola factory. "Back order? We have no big back orders on the Bitsurfr," the voice tells me. I am stunned. I call NECX, give them a piece of (what's left of) my mind and cancel the order. Start calling *Computer Shopper* advertisers until I find one that has a Bitsurfr in stock. I hit pay dirt on the first call: Another mail-order outfit, Compuability, has the adapter in stock and at a good price. It costs $269, a little more than NECX charged me. But they will ship it that afternoon.

NOV. 14: Terminal adapter arrives late afternoon. This is almost as good as . . . well, maybe not that good. I hook up my Bitsurfr. No joy and no ISDN, apparently. Turn on my cell phone and dial the number to get the time and weather. Sizzle, sizzle.

NOV. 15: Speak with the data team at the US West home office. They think the line may not be active. One of their technicians will check it.

NOV. 16: The line isn't active or working. There's a break or short in it. No spares are available. Need to do a major dig, according to US West. Have I fallen into an episode of *The Twilight Zone*? A US West technician laughingly tells me I'm getting a pretty good deal for $110, what with them having to dig up half the block.

NOV. 17: US West leaves a voice-mail message explaining that the "design problems" with my ISDN line will be solved in seven business days. Design problems? Is that what they call line breaks nowadays? The big question: Will this turkey work by Thanksgiving? I'm not holding my breath.

NOV. 20: The calling card I got from US West to accompany my ISDN line isn't valid anymore. The US West billing system can't handle this ISDN business until the line is fully installed and operational. They reject (again) the billing request from MCI, and MCI cancels my calling card. I am numb. I wonder if I should send my terminal adapter back to Compuability and just get a plain old analog line like regular folks?

Friends, family and my cat think I'm nuts. "You're going to pay $110 for them to install an ISD-what?"

I have this deep-seated urge to chant, "B channel, B channel."

My ISDN line isn't active or working. No spares are available. Need to do a major dig, according to US West.

NOV. 30: A US West technician shows up at my apartment to check my ISDN line, but I'm out of town. Fortunately, my sister shows up to feed the cat two minutes before the technician arrives. She lets him in to check the line. He tells her the line's OK and leaves. I get back on Dec. 3 and fire up my terminal adapter. Still no joy in Minneapolis.

DEC. 5: I decide to call customer service and report my problem. I need to talk with someone who can look into the local switch and see what's what.

DEC. 7: Charles from US West calls me about the trouble ticket. In less than 10 minutes, he checks out the programming, gives me the correct service profile identifiers (SPID), terminal identifiers and switch type. I've been given three different SPIDs so far. Will this be any different? That evening, I make the changes Charles suggested, pick up the phone and get a dial tone. Overwhelming relief. All I need now is an Internet provider to get me hooked up, and I'll be finished! Total elapsed time from placing the ISDN order to getting a working line: almost three months. No doubt I've lost thousands of dollars when you figure in all the time I've spent running in circles.

DEC. 8: With a smile on my face, I call the local Internet provider that specializes in ISDN. I spoke with a representative there in August. I tell the staffer I'm ready to go now. He tells me the company no longer deals with the Motorola Bitsurfr. He says if I want to use the company's service, I'll have to buy its hardware. Stunned silence. "How much?" I ask? "A thousand dollars," the staffer says. My smile goes away.

MIDDLE OF DECEMBER: At this point, I am much too busy with work and my activities with the Army Reserve to worry about getting on the Internet. My phone output port on the Bitsurfr works, so that's half the battle. At least I can make and receive calls now. If I get some free time, I can even surf the Internet via America Online.

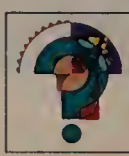
THE WEEK BEFORE CHRISTMAS: I find a provider that will accommodate my Bitsurfr. I get my IP address and — success! The battle is won. No more 28.8K bit/sec. modem connections for me. From now on, it's ISDN all the way.

EPILOGUE: If I had to do it over again, would I? Well . . . maybe. I have learned a lot about networking and high-speed data communications in the past three months, but the aggravation has been considerable, and I've put a lot of time and effort into the process.

To be fair, I think the US West data team tried its best. It was just a case of not having enough people to handle the job. And the job wasn't as simple as I'd presumed.

A special "Atta boy!" goes to Charles, the US West technician in Washington who finally got the switch programming straight. A big raspberry goes to the original Internet service provider that decided it didn't want to support the Bitsurfr — or me — after all.

If you're thinking about going with ISDN, I leave you with this advice: Maintain a sense of humor. That alone got me through. ■



Kevin Costner

Computer Careers

Working the room

Technology conferences can offer one-stop shopping leads for your next job

By Melanie Menagh

Technical trade shows are job fairs, says Steven Barrett, director of network and telecommunications at Lotus Development Corp. in Cambridge, Mass.

While there, Barrett says, "you're not only evaluating technology but your mind-set. If you don't have the right opportunities in your own work environment, you can look for it elsewhere."

Research pays off

Even if you're not actively job hunting, it pays to know about emerging opportunities. And though you may not find a job at your next technology conference, these events are great places to do basic research.

"It's like [being] a kid in a candy store: There's endless possibilities," says Jack Erdlen, president of Strategic Outsourcing, Inc. in Wellesley, Mass.

Erdlen says 40% to 60% of people find jobs through networking. But networking can be tricky. Questions to consider include the following:

- Which are the best events to attend?
- How can you make the most of the meetings without coming off as pushy or indiscreet?
- Who are the most useful people to network with?
- What are the key questions to ask?

Barrett says larger shows can be tough: "You're going to spend most of your time trying to understand the technology and take it home and look like a hero."

On the other hand, he adds, at small shows "you're probably more in your element and more able to get around, and the other people are there to exchange information."

Erdlen says ideally you should do both. "Small events have fewer opportunities but more meaty ones; larger ones take more work but promise broader scope," he says.

"Technical trade shows are job fairs. If you don't have the right opportunities in your own work environment, you can look for it elsewhere."
— Steven Barrett, director of network and telecommunications at Lotus

Joe Danielewicz, data administrator at Motorola, Inc. in Tempe, Ariz., says he prefers conferences to shows. "At the big trade fairs, people are there to sell products. But at conferences, you're there to listen to people talk and to have your input. So it's natural to exchange information," he says.

Be prepared

The game plan should include some advance preparation, especially for large events. Read the conference directory before you go, scan recent industry articles and check back issues of trade publications for companies that are working in areas you might be interested in.

"Make a hit list of people you want to see," Erdlen says. "Plan which sessions you think will be essential to attend."

"Companies are sending whole delegations [to shows, including] many more management people. Now, more than ever, you're likely to meet higher-level people involved in all aspects of the decision-making and hiring process."
— Charlie Hurth, vice president of marketing at Digital Consulting

Preparing yourself with knowledge of the company can be a useful entree, Danielewicz says. "Homework is a good idea. Find out what companies' major trusts and hot buttons are. I'm shy; it's always nice to introduce myself with a subject or a name that people know about," he says.

Come armed with a quick list of pointed questions, because attendees are there trying to sell, not hire.

And you don't need to talk directly to a human resources person. Even the sales force manning the booth will have a lot of useful information, says Kevin Steele, president of Winter Wyman & Co., a recruiting firm in Waltham, Mass.

"Find out whether the technologies in play at that company fit into your background," Steele says. "Another gating factor can be: Where is job expansion taking place, and what technologies are vital to their product development cycle? Does this match your skill set?"

Charlie Hurth, vice president of marketing at Digital Consulting, Inc. in San Jose, Calif., organizes events for his company. He says job-hunting attendees can test for a potential employer's stability.

"Explore what other companies they're tied in to. They usually display not only their own wares but also third-party products from corporate alliances. See what they're doing and with whom. You want to know who's going to be around in six months," Hurth says.

Steele encourages attending roundtable discussions.

"There you sit shoulder-to-shoulder with other professionals sharing a topic of discussion. You can get a real feel for people," Steele says. "This can open the door afterward to a more personal discussion of how your goals might fit in to that person's plans."

Ask for names

Erdlen says he likes the potential of lectures. "Go to a session where someone really prominent is speaking and try to get a few minutes afterward with them to get suggestions. They may have been talking to a company that looks like a good career prospect. Find out who to contact and if they would mind your using their name," Erdlen says.

Danielewicz says he prefers social situations for networking.

"It's always a good time to find out what's happening, projects that are staffing up. People are more relaxed and likely to give you an unguarded answer," he says.

Experts are decidedly bullish on networking at shows and conferences, primarily because it's a bull market, Danielewicz says.

"We're going through a huge growth cycle," Hurth says.

"With mergers and acquisitions and the phenomenal growth of the Internet and electronic messaging, companies are sending whole delegations [to shows, including] many more management people. Now, more than ever, you're likely to meet higher-level people involved in all aspects of the decision-making and hiring process," he says.

"At the big trade fairs, people are there to sell products. But at conferences, you're there to listen to people talk and to have your input. So it's natural to exchange information."
— Joe Danielewicz, data administrator at Motorola

Menagh is a freelance writer in New York.

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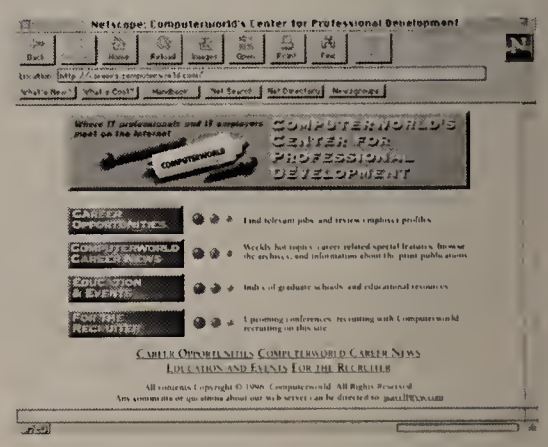

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Systems Engineer - Analyze user requirements, procedures & problems to automate processing or to improve existing comp. sys.; confer with personnel of organizational units involved to analyze current operational procedures, identify problems & learn specific input & output requirements; write detailed description of user needs; program functions & steps req'd to develop or modify comp. program; review sys. capabilities, workflow & scheduling limitations to determine if requested program or program change is possible within the existing sys.; conduct studies pertaining to development of new information sys. to meet current & projected needs; C programming; CAD design & implementation; & handle h/w & s/w interface including BIOS I/O interrupt. Reqs. Master's in Comp. Engineering, Electrical Engineering, or Comp. Sci. or its foreign educational equiv. & 1 yr. exp. in job offered or 1 yr. related exp. as a Research Assistant, Programmer, Programmer Analyst, Systems Analyst, S/W Engineer or Consultant. 3 mos of the exp. in the job offered or related occup. which included C programming; handling h/w & s/w interface including BIOS & I/O interrupt; & CAD design. $41,003/yr. 40 hrs/wk., 8a-5p M-F. Send resume to Job Service of Florida, 1001 Executive Center Dr., Orlando, FL 32803-3520. Re: Job Order number FL-1374789.

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SENIOR SOFTWARE ENGINEER to analyze, design, develop, test, implement, maintain and support application software on IBM 3090, ES 9000, HCL minis, IBM PCS and UNIX hardware platforms using CICS, DB2, Micro Focus COBOL, COBOL, COBOL II, BASIC, C, POWERBUILDER, ORACLE, SYBASE, INTERTEST, JCL, RPF, Datacom/DB, IDEAL, SPUFI, ADW, VSAM, IEF, GUPTA, ROSCOE, TSO/ISPF, CA/DATADICTIONARY, CA/DATAQUERY, CLIST, MS ACCESS, MS EXCEL and WordPerfect under various IBM operating systems, MS-DOS, MS-Windows and network operating systems such as Novell Netware, MS Lan Manager and Windows for Workgroups; Develop algorithms and optimization techniques to finetune various network database applications. Require: B.S. degree in Computer Science/ Engineering and four years of experience in the job offered; Extensive paid travel (50%) to client sites within the U.S. 8 a.m. to 5 p.m. Salary $48,000/year; Apply with resume or in person to: Georgia Department of Labor, Job Order # GA 5941990, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Department of Labor Field Service Office.

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SENIOR SOFTWARE ENGINEER — MS degree in Comp. Sci. and 2 yrs exp in job offered (or 2 yrs exp as software eng) in devel. of object-oriented software using C++ on UNIX & 1 yr using ORACLE; must have knowledge of TCP/IP, SMTP, & Network Mgt. Protocols to design & develop Network Management software using Object-Oriented designs and C++ on UNIX platforms. Salary: $58,000/yr.; 40 hrs/wk. Ref. to prove exper required. Contact Ga. Dept. of Labor, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Dept. of Labor Field Serv Office. GA Job # 5941699

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SYSTEM ANALYST — MS degree in Comp. Sci. & 18 mo exper in job offered or 18 mo exp as software engineer and/or programmer. Exp must be in C/C++ with at least 1 yr in Object Oriented design, programming & methodology & MS Windows and 6 mo in UNIX/Windows NT & Windows 95, development of libraries using microsoft MFC, Borland OWL class libraries using debugging tools such as SDB and maintaining software using SCCS; references to prove experience. Salary: $68,640/yr.; 40 hr/wk. Contact Georgia Dept. of Labor, 1535 Atkinson Road, Lawrenceville, GA 30243-5601 or the nearest Dept. of Labor Field Serv Office. GA Job # 5943772

PROGRAMMER to design, develop, test, implement, maintain and support Graphical User Interface (GUI) software systems for business applications in a client-server environment using PowerBuilder, RDBMS, Sybase, Watcom, SOL Forms, C, Visual Basic and Erwrin case tool under the Windows operating system; Analyze business processes to determine requirements; Prepare documentation and programming specifications; Create application prototypes for client approval; Customize and modify applications per changes in requirements; Train users in application usage. Require: B.S. degree in Computer Science with three years ot experience in the job offered or as a consultant. An M.S. degree in Computer Science with one year of experience (full or part-time equivalent) in the job offered or as a consultant, gained before or atter earning degree, may be substituted for a B.S.C.S. degree and three years of experience. Salary: $50,000/year, M-F, 8 a.m. to 5 p.m. Apply with resume to: Job Service of Florida, 2810 Sharer Rd., Suite 30 B, Tallahassee FL 32312, RE. Job Order # FL-1366547

Systems Development Engineer: Provide services to customers in development of equipment control systems & intermodal transportation systems; define customer specifications & systems requirements to construct & implement software packages; design and/or enhance & implement software on the IBM-3090 system under MVS/ESA using Cobol, Cobol II, CICS, DB2, VSAM, JCL, FileAid, Expeditor & TSO/ISPF: develop databases for maintaining transportation & equipment controls; oversee integration, conversion & testing of software systems; fine-tune mainframe applications & provide needed technical support to keep systems at peak operating ability. $48,000/yr. 40 hrs/wk. M-F. B.S. or equivalent in Computer Sc. or Computer Eng. & 2 yrs. exp. in job offered or 2 yrs. related exp. as Software Engineer, Systems Consultant or Sr. Systems Analyst to include use of IBM-3090, MVS/ESA, Cobol II, CICS, DB2, VSAM, JCL, FileAid, Expeditor & TSO/ISP. Send resume to the Georgia Department of Labor, 2943 N. Druid Hills Rd , Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office. Job Order #GA5939909.

APPLICATION PROGRAMMER to modify Lawson v6.0 applications for accounting, purchasing, inventory, order entry to maintain inventory control, sales reports, customer activities and data analysis using Micro Focus COBOL on an internetworking AIX v3.2.5 system for RISC 6000 machine; Implement and test applications of Lawson and Realworld running on IBM/SP2 parallel internetworking system; Develop comparison reports on market price, specifications and status for networking series products, hard drives, CD-ROM and Multi-Media Kits products, and reports for inventory evaluation, customer order tracking, and customer activities using Oracle and Universe 4GL under the UNIX operating system; Support end users ot Lawson and Realworld applications; Plan, maintain and implement network IPX/SPX, TCP/IP protocol environments in existing network operating systems such as Netware, UNIX and Windows for Workgroup environments for end users. Require: B.S. degree in Computer Science and two years ot experience in the job offered An M.S. degree in Computer Science with a demonstrated ability to perform job duties as evidenced by previous coursework/work experience may be substituted for B.S.C.S. and two years experience. Salary: $35.000/year, M-F, 9 a.m. to 6 p.m. Apply in person or by resume to: Georgia Department of Labor, Job Order # GA 5942001, 1535 Atkinson Road, Lawrenceville, GA 30243-5601 or the nearest Department of Labor Field Service Office.

Programmer Analyst. Atlanta, Georgia. Design and develop application software on IBM AS/400, PC-LAN's using MSDOS, and UNIX using radio frequency devices. Perform customer support, systems integration, documentation and testing. Extensive background in software development for application in warehouse management and accounting. Knowledge of Pro C, COBOL, FORTRAN, PASCAL, C, state of the art radio frequency technology in RDBMS, and ORACLE. Requires bachelors degree in Computer Science and 2 yrs exp as programmer analyst. $3,300-3,700 mo. EOE. Resume to: Ga Dept of Labor, JO#GA 5940895, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest DOS Field Service Office.

Programmer Analyst. Atlanta, Georgia. Design and develop application software on IBM AS/400, PC-LAN's using MSDOS, UNIX and other utilities using radio frequency devices. Perform customer support and training end users. Systems integration, analysis, documentation & testing. Extensive exp in software development for applications in warehouse management, production & order process systems. Knowledge ot state ot the art radio frequency technology, RPG, COBOL, & C. Requires bachelors degree in Electronics, Electrical or Computer and 2 yrs exp as programmer analyst or software engineer. $3,300-3,700 mo. EOE. Resume to: Ga Dept of Labor, JO#GA 5940895, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest DOS Field Service Office.

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Questions should be directed to:
Prof. Jeffrey L. Whitten, Dept. Head [voice: (317) 494-4545; e-mail: jlwhitte@tech.purdue.edu].
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Client/Server Specialist (Software Engineer): Duties: Direct and coordinate systems design and development projects; research, design, and develop computer software systems, in conjunction with hardware product development applying principles and techniques of computer science engineering and mathematical analysis, analyze software requirements for customers, and participate in the development of special applications; confer with systems users regarding system customization and analysis; evaluate operational and performance requirements for application and implementation of newly developed technology into standard product line; develop and direct software system testing procedure, programming and documentation; prepare interim and final project reports for management; consult with customers concerning maintenance of software systems. Applicants should possess 5-6 years of college, an M.S. degree in Computer Science, or must have completed all coursework for M.S. One (1) years experience in the position, or three (3) years experience as a Computer Consultant. Graduate-level education must include at least one (1) course in each of the following subjects: Database Systems; Operating Systems; Computer Architecture; Computer Networks; Algorithm Analysis. Experience in related occupation must include: Networking, programming, and database management systems programming and administration of FTP/NFS/RFS server and LAN Manager server; UNIX, Oracle, PowerBuilder, Sybase and Windows based development environments. 40 hrs./wk.; 8:30 A.M. - 5:30 P.M.; $40,000.00/year. Must have proof of legal authority to work permanently in the U.S., if offer of employment is extended. Send resumes to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois, 60605. Attn: Joan Sykstus. Reference #V-IL 13927-S. AN EMPLOYER PAID AD. NO CALLS. SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

PROGRAMMER ANALYST [2 openings] (Ref. 05696) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems; evaluate user request for new or modified programs; determine feasibility, cost & time required compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; formulate plan outlining steps required to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Database administration, development & maintenance using UNIX, SYBASE, DB-Library, T-SOL & C. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in ed & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, System Analyst, Software Engineer, Consultant, Systems & Sr. Systems Engineer or Project Leader. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed, & exp. Must have some related exp. including database administration & development & using each of the following: UNIX, SYBASE, DB-Library, T-SOL & C. $53,000/yr. 40 hrs/wk., 8:30a-5p. Send resume to 7310 Woodward Ave, Rm. 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

ANALYST/PROGRAMMER - From client requirements develop specifications. Analyze, design, develop, test, implement, document software. Req Bachelor's Comp. Sc. or Electronic Engrng & 1 yr exp in job or related EDP occupation. Exp must incl SYBASE & Utilities (RDB), POWERBUILDER, & DBA. $40,000/yr. 40hrs/wk. 9:30-6:30, Mo-Fri. Job Site: Boston, MA. Send 2 copies of resume to Case #51322, P.O. Box 8968, Boston, MA 02114.

CAD/CAM Applications Eng. responsible for designing and programming manfacturing simulation software for automobile company clients using rapid application development techniques. Duties include interacting with Quality and Manufacturing Depts. Specific projects include designing software for automotive powertrain components using design principles and finite element techniques utilizing CAD/CAM; develop software applications for company's business clients and design data models for the application using C, PL*SOL, SOL*PLUS, SOL*FORMS in ORACLE 6.0/7.0. Require Master in Computer Science. Employer will accept equivalent foreign degree. Require 1 yr. exp. as a Programmer/Analyst which includes designing and developing using ORACLE 6.0, SOL Forms, SOL Plus and C, and design and analysis using CAD/CAM. Master coursework must include Advanced Finite Element Analysis and Design of Experiments. Master's project must involve Finite Element Analysis. 40 hr wk. 9am-5pm, $42,000/yr. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202. Ref. No. 10596. Employer Paid Ad.

Systems Analyst - Writing detailed specifications for membership system for a major health insurance carrier to allow the programs to access IMS using COBOL II. Analyze the structure of old and new data, as well as the programs that use and manipulate this data. Changes will also be specified for converting COBOL I programs to COBOL II. Detailed test scripts are created that specify necessary systems tests. Desired results are specified for each test to insure the tests have been properly coded. **Special Requirements Include:** In addition to the foregoing specified languages and data structures, the candidate must have experience working on a project involving a membership system for a major healthcare insurance carrier, as well as an in-depth knowledge of hierarchical databases and detailed design techniques. **Minimum education and experience:** High School + Four (4) years of experience. **Hours per week:** 40 - **Rate of Pay-** $865.38 per week. The Job Order # for the Job Opportunity is 338113. Send resume to: Shirley J. Gregory, Missouri Division of Employment Security, 1411 Main Street, Kansas City, MO 64105. Must have proof of legal authority to work in the United States.

Software Engineer - Morrisville, NC to design and develop UNIX based software for : Network Communications and related GUIs using Motif/AIC; X.25 and SNMP applications; and Network monitoring and analysis conforming to existing MIBs for RMON based SNMP agents. Use CMVC for source code control and management. Languages, tools and packages used: C++, ASN.1, C, RPC, IPC, SNMP, CMVC, Xlib, Motif 1.2, AIC. 8am-5pm. M-F 40hrs/wk. $54,000/yr. Require M.S in Computer Engineering/Comp. Science or Equiv. degree and 2 years' exp. in job offered or 2 years' as Systems Analyst, Consultant, programmer or equivalent industrial position. Experience must include: Software design and development in UNIX with C++; working with X.25, ASN.1 and SNMP; design and develop Distributed computing software; and work with GUI prototyping tools such as AIC. Upto 100% employer paid travel within U.S. possible. Send resume with copy of ad attached to Lee Conover, CDI Southeast, 8000 Aerial Center Parkway, Suite 100, Morrisville, NC 27560 .

Software Engineer - Majority of time at client locs in Boston metropolitan area; balance of time in CA. Analyze software requirements; evaluate interface between hardware & software; formulate, design systems as needed; direct systems testing procedures; supervise 1-2 progs; interface w/clients; use: MOTIF 1.1, Oracle 7.0, OCI, Interface Architect, OEC Tools & HP-UX. Bachelors/Comp Sci., Engg or Math. 2yrs/exp. in job offered or 2yrs as Prog/Analyst. Related occ must incl. 2yrs/exp. using MOTIF 1.1, Oracle 7.0, OCI, Interface Architect, OEC Tools & HP-UX. 40hrs/wk (9-6; M-F) $41,000/yr. Send resume in dupl. to Case # 51350, PO Box #8968, Boston, MA 02114.

Systems Engineer. Research, design & develop moderately complex computer software systems in conjunction with hardware integration for financial transactions applications. Tools: Powerbuilder, Object Oriented Design Techniques (OOD); Sybase SOL server; UNIX; Application Performance tuning; Appraisal Management and Tracking System (AMTS). B.S. in Computer Science* plus 2 yrs exp. in job offered or in software Development. (*B.S. degree in any engineering field plus 1 yr exp. in software development acceptable in lieu of B.S. in Computer Science.) Two yrs previous exp. must include Sybase or other Relational Database Management Systems; Object Oriented design; Application Performance tuning; UNIX; and six mos. exp. using Powerbuilder. 40 hrs/wk, 9am-5pm, $42,000/yr. Must have proof of legal authority to work in U.S. Send resume to DES Workforce Center, 215 Keo Way, Des Moines, IA 50309-1727. Please refer to Job Order IA1100465. Employer paid advertisement.

Programmer/Analyst - Majority of time at client sites in Moline, IL; balance of time in Peoria, IL & Chicago, IL. Analyze, evaluate proposed & existing systems; enhance, modify programs & software; write specifications & code; use OS/2, OS/2 Database Manager, ENFIN and DB2/2. Bachelors/Comp. Sci, Engg or Math. 2yrs/exp. in job offered. Exp. must incl. 1 yr using OS/2, OS/2 Database Manager, ENFIN, DB2/2. Must be willing to travel & relocate as needed (reimbursement by employer). 40hrs/wk (9-6; M-F) $54,000/yr.; OT as needed @ $25.96/hr. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to: Illinois Dept. of Employment Security, 401 South State St. - 3 South, Chicago, IL 60605. Att: Ruth Daniels. Ref. # V-IL-13780-R. NO CALLS. AN EMPLOYER PAID AD.

Senior Systems Engineer. Lead the research, design & development of complex computer software systems in conjunction with hardware integration for financial transaction applications. Tools: Powerbuilder; Sybase SOL server; Object Oriented Design Technique (OOD); UNIX; Appraisal Management Tracking System (AMTS). B.S. in Computer Science or Engineering plus 4 yrs exp. in job offered or in Systems Analysis and Design. Four yrs exp. must include Sybase SOL server or other Relational Database Management System; UNIX; and one year experience with Powerbuilder. 40 hrs/wk, 9am-5pm, $56,000/yr. Must have proof of legal authority to work in U.S. Send resume to DES Workforce Center, 215 Keo Way, Des Moines, IA 50309-1727. Please refer to Job Order IA1100462. Employer paid advertisement.

Senior Systems Analyst to supervise and coordinate development of coordinated order processing system in major manufacturing environment; develop application system on PC-486 and IBM 3090 using MF COBOL WORKBENCH, COBOL II, XDB, DB2, CICS, PANVALET, QMF, Platinum Tools for DB2, EXPEDITOR and DESIGN/I; design, implement and conduct test plans and programs consisting of several online and batch programs for order entry stage through manufacturing processing to shipping and invoicing as well as programs for management reporting functions. Require Master in Computer Science or Elec. & Comm. Eng. Employer will accept equivalent foreign degree. Require 3 yrs. exp. as a Systems Analyst which includes performing systems programming and analysis using IBM Mainframe and IBM 3090 hardware and DB2, CICS, COBOL, COBOL II, and EXPEDITOR software for various processes and application requirements. 40 hr. wk 9am-5pm. $51,450/yr. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202, Ref. #107-96. Employer Paid Ad.

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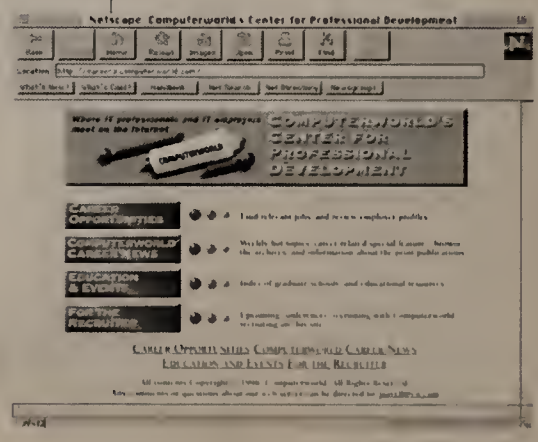

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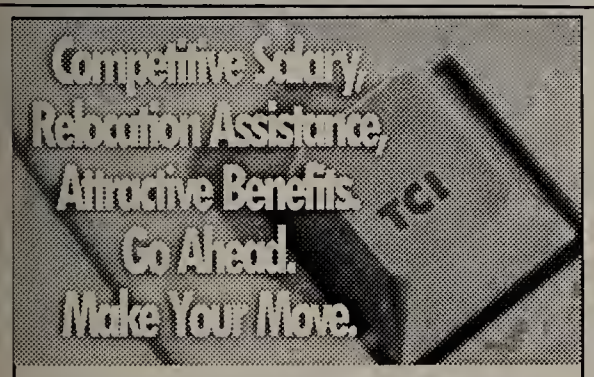

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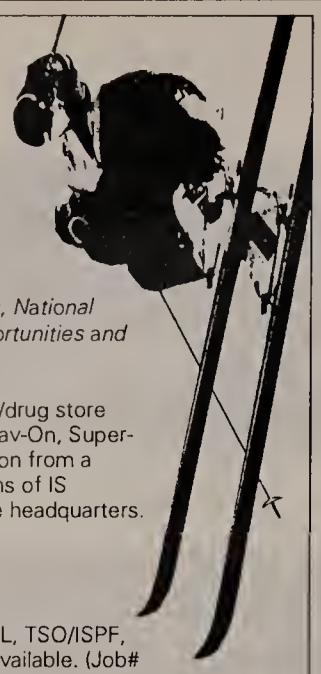

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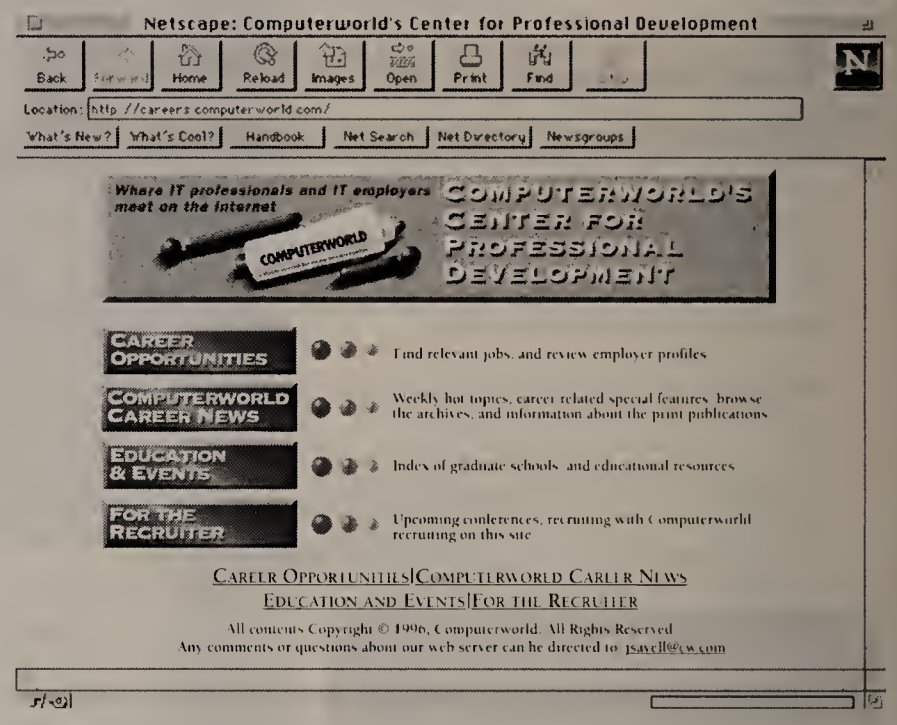

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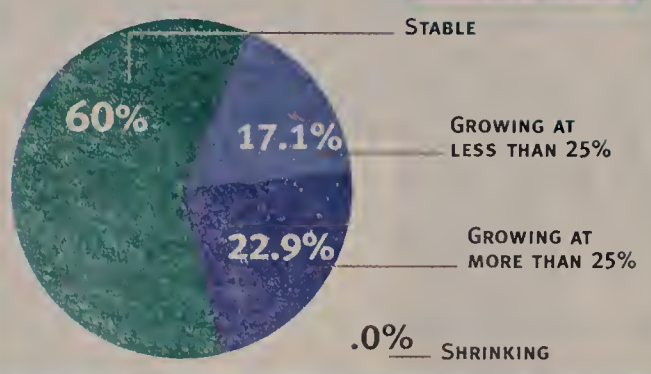

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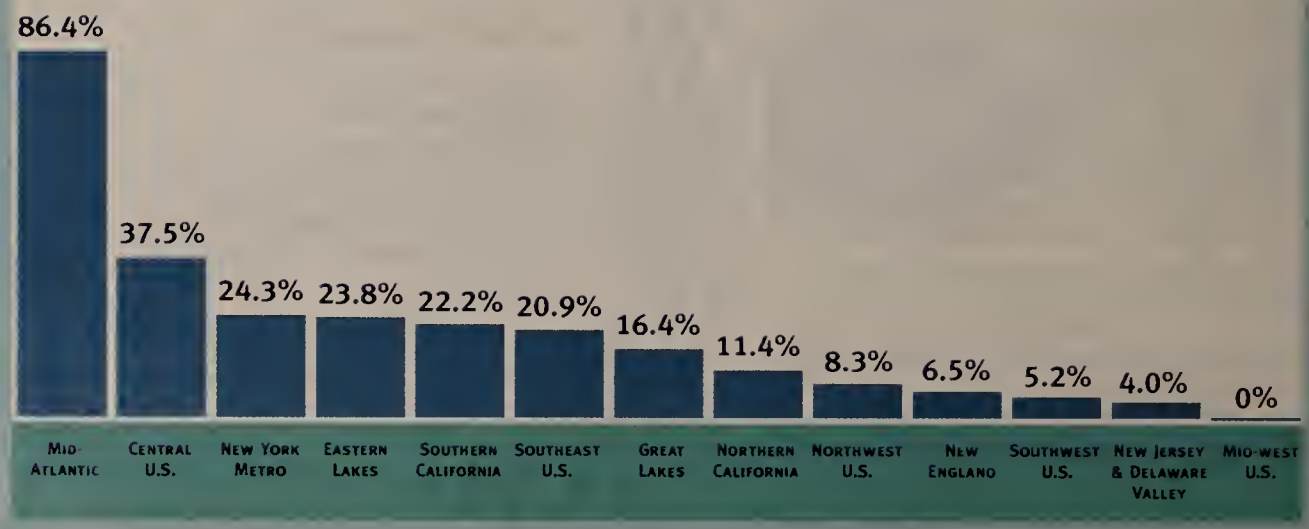

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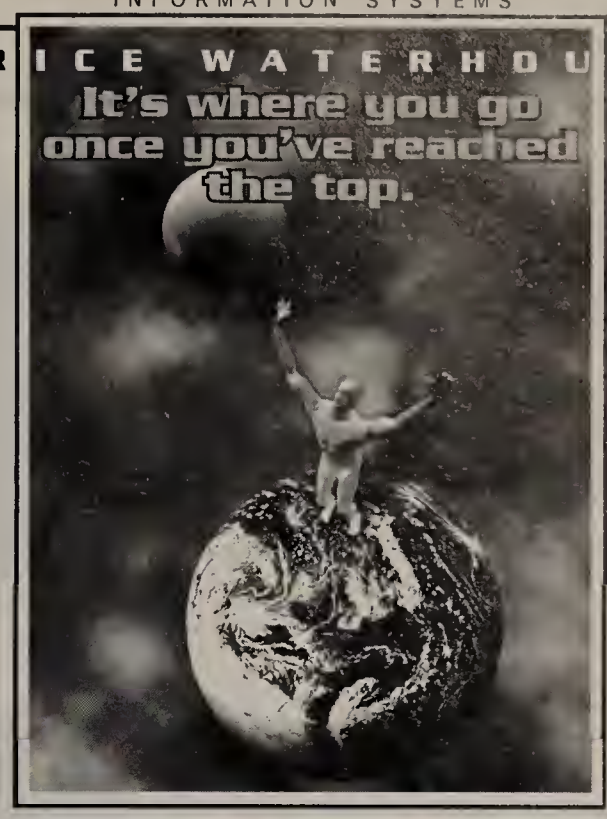

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Loyalists keep the faith with Xbase

By Daniel Lyons

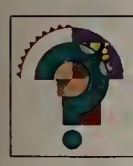
The Xbase market has seen better days.

In recent years, database management products built on Xbase languages developed by Ashton-Tate Corp. have been displaced by stronger competitors. Xbase products are now used mostly by die-hard fans.

"There's a very select group of people who are very religiously loyal to Xbase," says Nicole Roth Miller, a senior analyst at International Data Corp., a market research firm in Framingham, Mass. "But Xbase is kind of passe."

Consider that in 1992, Borland International, Inc.'s dBase, the bellwether product in the Xbase market, had 27% of the total IBM-compatible PC database market and was the biggest player. But by 1994, dBase's share fell to 11%.

In the same period, Microsoft Corp.'s Access, a non-Xbase database, grew from 5% of the IBM-compatible PC database market to 40%.



Clive Sinclair

In the Windows-only market, the picture is even bleaker. In 1994, Access had 53% of the Windows database market, and dBase had 9%.

Xbase software

"The fall of dBase relays the story of the entire market," Miller says. "The overall Xbase market has been slowly declining."

Suite success

Part of the reason for the triumph of Access over Xbase is that many users have gotten Access by default in the Microsoft Office suite. Also, Access is easy to use and is probably the best product for novice users, analysts say.

And at the high end of the database market, where professional developers reside, Xbase products have faced strong competition from client/server development tools.

"There has been a major shift in the market, and it has left Xbase behind," says Paul Cubbage, director of client/server software research at Dataquest, Inc. in San Jose, Calif.

Cubbage says Borland is partly to blame for the decline of Xbase because the company took too long to put a graphical user interface on dBase, which it bought from Ashton-Tate. "I think the folks at Borland fell asleep at the switch," he says.

Cubbage and Miller say the Xbase language, which once was the most popular desktop programming environment, could again be king if a compelling tool that ran on top of it were developed.

Richard Finkelstein, president of Performance Computing, Inc., a database consulting firm in Chicago, says he rarely uses or recommends Xbase products. "The only one that's viable is FoxPro — and not for client/server development but for a small workgroup application. I could recommend FoxPro under certain circumstances, and it does offer better performance than Access," he says. ■

Lyons is a freelance writer in Ann Arbor, Mich.

Leading Xbase DBMS vendors

Visual FoxPro 3.0 for Windows

Price: $499 for professional edition, $199 for standard edition
Description: Released last year, Visual FoxPro 3.0 is Microsoft's first object-oriented version of its FoxPro database product. Visual FoxPro 3.0 is a 32-bit product for Windows 95. The product includes a set of 32-bit Open Database Connectivity drivers for various back-end databases, including SQL Server and Oracle.
Microsoft Corp.
(800) 426-9400
www.microsoft.com

Visual dBase for Windows 5.5

Price: $349.95
Description: dBase is the granddaddy in this market. Visual dBase 5.5 is Borland's second object-oriented version, and officials say that fact sets their product apart from other Xbase players that are still selling first-release versions of object-oriented products. Another key feature in Version 5.5 is the presence of a compiler, something dBase customers had long clamored for. Both products support Microsoft's Windows 3.1 and Windows 95.
Borland International, Inc.
(408) 431-1000
www.borland.com

CA-Clipper 5.3

Price: $199
Description: CA-Clipper is a DOS-based product. Version 5.3, released last August, includes a Windows-based workbench for visual development of DOS applications. Computer Associates officials say the product is a "stepping-stone" from DOS to the world of object-oriented development. CA also sells Visual Objects, a Windows-based object-oriented Xbase development environment. Priced at $895, Visual Objects is aimed at professional developers.
Computer Associates International, Inc.
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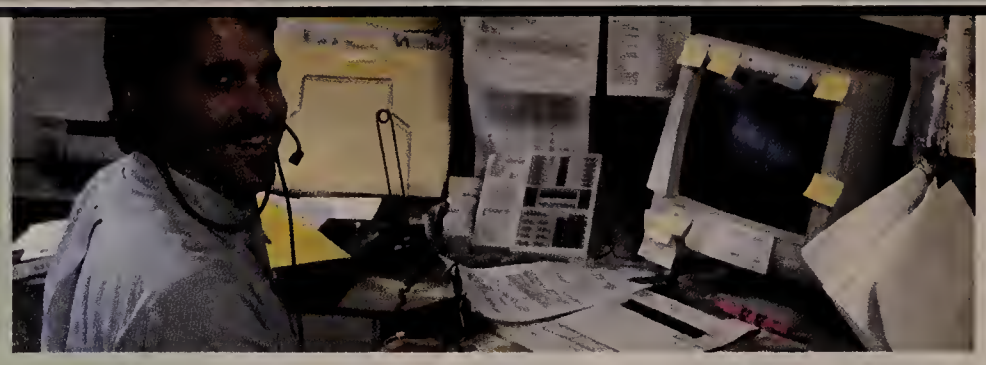

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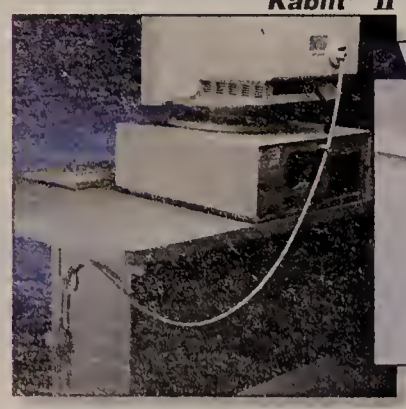

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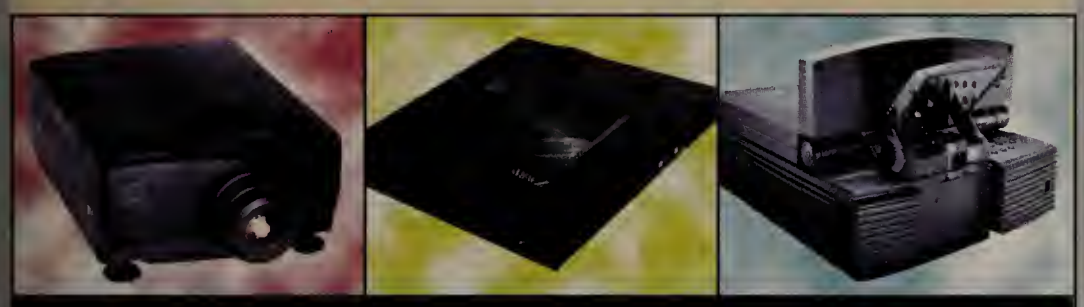

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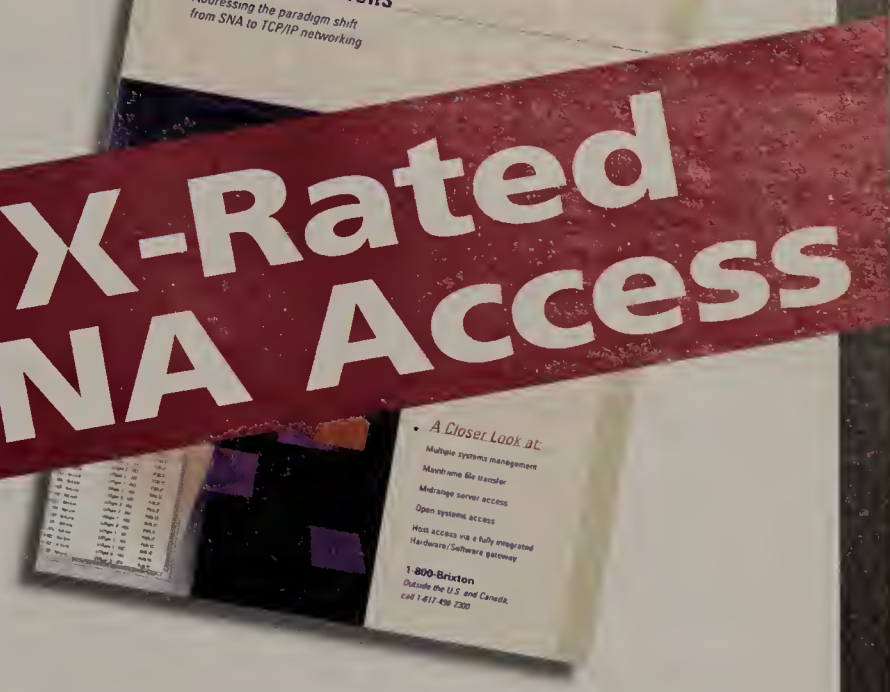

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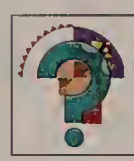

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Gainers

Percent

Intelligent Electronics(L)	58.3
Walker Interactive Systems(H)	33.3
Optical Data Systems Inc.	26.9
Merisel(L)	25.9
Micron International Inc.	23.8
Manugistics Group Inc.	22.2
Compuware Corp.	22.2
Analog Devices Inc.(H)	21.4

Dollar

Cascade Communications(H)	9.88
Cisco Systems Inc.(H)	7.00
Microsoft Corp.	7.00
8ay Networks Inc.	6.50
Xerox Corp.	6.38
US Robotics	6.25
AMERITECH Corp.(H)	5.50
America On-Line(H)	5.38

Losers

Percent

Dataram Corp.	-23.1
Printronix Inc.	-16.5
Netrix Corp.	-15.5
Platinum Technology(L)	-14.8
Micropolis Corp.(L)	-14.3
Weitek	-13.6
Netscape Comm. Corp.	-11.4
Systemsoft Corp.	-10.8

Dollar

Netscape Comm. Corp.	-8.50
Intuit Inc.	-6.25
Cambridge Tech. Partners	-4.25
Printronix Inc.	-3.50
Discreet Logic Inc.	-2.63
Platinum Technology(L)	-2.13
Sierra Semiconductor	-1.75
Systemsoft Corp.	-1.50

Industry Almanac

Cascade hits new heights

In what is perhaps indicative of a trend, several networking vendors in the past week saw their stock price grow faster than crabgrass in the summertime.

After **Cascade Communications Corp. (CSCC)** announced its most recent quarterly financial results, its stock rose more than 13 points in two days (see chart).

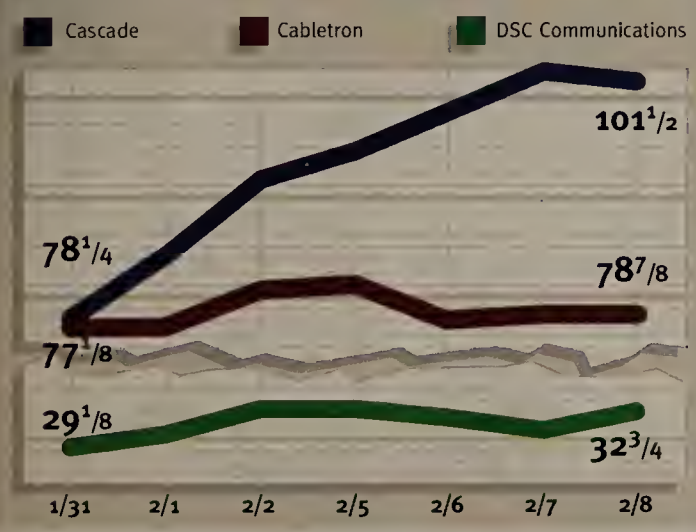
"[The results] are blowout numbers. It shows that Cascade is really firing on all cylinders right now," said Neil Danzger, an analyst at Morgan Stanley & Co. in New York. Cascade's products are used by several Internet access providers, including NetCom On-Line Communications Services, UUNet Technologies and PSINet, Inc. The company's quarterly results show its overall strength in the frame-relay service business, he said.

Other networking companies that are enjoying the recent rise in stock prices include **Cabletron Systems, Inc. (CS)** and **DSC Communications Corp. (DIGI)**. The general rise shows that the networking industry "is among the most healthy in the world," said Noel Lindsay, an analyst at Hambrecht & Quist in San Francisco. This health springs from several sources, including "ongoing migration from shared-media LANs to LAN switching and ATM [Asynchronous Transfer Mode], the growth in the remote access market and the growing demand from huge markets in Asia and Japan," he said.

DSC Communications, a broad-based supplier to the telecommunications industry, was aided by the anticipation of the passage and signing of the telecommunications bill. The new law also pumped life into other firms in the networking sector because it is expected to allow telephone companies to spend more money, Danzger said. — *By Stewart Deck*

A rising tide

Good news and financial results in the networking sector lifted several companies' stock prices



Exch	52-Week Range			Feb. 9 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 3.08%**
COMS	53.63	23.88	3COM Corp.	50.25	4.75	10.4
AIT	65.75	40.75	AMERITECH Corp. (H)	65.75	5.50	9.1
APTS	15.00	2.75	Apertus Tech.	3.31	-0.31	-8.6
T	68.88	47.88	ATT	66.50	1.75	2.7
ASND	47.25	6.63	Ascend Communications (H)	45.00	1.88	4.3
8NYN	18.63	6.00	8anyan Systems Inc.	7.88	-0.38	-4.5
8NET	50.00	20.38	8ay Networks Inc.	48.38	6.50	15.5
8EL	72.63	50.75	8ell Atlantic Corp. (H)	72.13	3.25	4.7
8LS	45.88	28.25	8ellsouth Corp.	44.25	2.00	4.7
88N	48.75	15.63	8olt, 8eranek and Newman	30.25	0.50	1.7
8RKT	35.00	10.50	8rooktrout Technology (H)	33.00	1.13	3.5
CS	87.75	38.13	Cabletron Systems	79.75	2.38	3.1
CSCC	102.50	30.38	Cascade Communications (H)	101.50	9.88	10.8
CGRM	25.13	12.75	Centigram Communications	17.25	1.38	8.7
CSCO	91.50	32.63	Cisco Systems Inc. (H)	91.50	7.00	8.3
CLIX	11.38	6.00	Compression Labs Inc.	8.25	0.50	6.5
CMNT	12.75	4.00	Computer Network Tech.	4.75	0.13	2.7
XCOM	14.50	8.75	CrossComm	11.13	0.50	4.7
DIGI	64.00	21.88	DSC Communications	32.38	-0.63	-1.9
FORE	67.75	25.50	FORE Systems Inc.	63.75	4.88	8.3
GDC	26.50	9.25	General Datacomm Inds.	13.13	-0.13	-0.9
GSX	42.50	28.00	General Signal Networks	35.63	0.63	1.8
GTE	48.63	31.88	GTE Corp. (H)	48.63	2.63	5.7
MCIC	30.13	19.09	MCI Communications Corp.	28.75	0.75	2.7
MICM	12.50	5.50	MICOM Communications Corp.	7.50	-0.19	-2.4
MNPI	28.00	9.00	Microcom Inc.	26.75	2.00	8.1
NETM	34.00	10.00	NetManage Inc.	12.00	-0.88	-6.8
NTRX	9.88	3.63	Netrix Corp.	4.44	-0.81	-15.5
NCDI	12.00	4.38	Network Computing Devices	5.38	-0.50	-8.5
NWK	42.00	19.75	Network Equipment Tech.	31.38	2.75	9.6
NETG	46.50	22.75	Network General	40.13	0.50	1.3
NN	53.25	25.00	Newbridge Networks Corp.	51.63	-0.63	-1.2
NT	49.13	31.50	Northern Telecom Ltd. (H)	49.13	3.50	7.7
NOVL	23.25	12.00	Novell Inc.	14.25	1.00	7.5
NYN	59.25	38.00	Nynex Corp. (H)	56.00	2.38	4.4
OCTL	42.63	18.00	Octel Communications Corp.	36.50	1.75	5.0
ODSI	43.25	12.75	Optical Data Systems Inc.	24.75	5.25	26.9
PCTL	43.88	12.00	Picturetel Corp.	40.38	0.63	1.6
PTON	10.75	5.50	Proteon Inc.	6.00	-0.50	-7.7
RACO	7.88	4.25	Racotek Inc.	4.75	0.00	0.0
RETX	5.50	1.81	Retix	3.88	0.44	12.7
SFA	24.88	11.38	Scientific Atlanta Inc.	17.00	0.00	0.0
SHVA	78.25	27.00	Shiva Corp. (H)	76.50	5.00	7.0
S8C	60.25	39.63	Southwestern 8ell Corp.	59.13	1.50	2.6
FON	44.75	27.75	Sprint Corp. (H)	44.50	1.75	4.1
SMSC	30.50	12.50	Standard Microsystems Corp.	16.63	-1.13	-6.3
STRM	83.25	32.00	Stratacom Inc. (H)	79.63	-0.13	-0.2
T8IT	8.63	2.38	Telebit Corp.	4.75	0.13	2.7
USRX	110.50	25.75	US Robotics	100.00	6.25	6.7
USW	48.38	28.38	US West Inc.	36.63	0.75	2.1
XIRC	19.00	8.88	Xircom	9.88	-0.88	-8.1
PCs and Workstations						**UP 0.00%**
AALR	9.63	4.13	Advanced Logic Research	6.88	-0.25	-3.5
AAPL	50.13	26.84	Apple Computer Inc.	27.88	-1.38	-4.7
ASTA	19.13	7.50	AST Research Inc.	8.00	-0.25	-3.0
CPQ	56.75	31.13	Compaq Computer Corp.	51.00	3.50	7.4
DELL	49.38	19.75	Dell Computer Corp.	31.88	2.75	9.4
GATE	37.50	16.00	Gateway 2000 Inc.	27.13	0.50	1.9
HWP	96.63	50.75	Hewlett Packard Co.	89.88	3.00	3.5
MUEI	29.88	8.75	Micron International Inc.	13.00	2.50	23.8
NIPNY	75.13	45.13	NEC America	61.38	1.25	2.1
SGI	45.63	21.13	Silicon Graphics	28.25	-0.50	-1.7
SUNW	51.50	15.00	Sun Microsystems Inc.	48.38	1.00	2.1
Large Systems						**UP 3.44%**
AMH	13.63	6.75	Amdahl Corp.	8.06	0.44	5.7
CYR	900.00	15.38	Cray Research Inc.	25.38	0.00	0.0
DGN	19.13	6.75	Data General Corp. (H)	18.63	2.75	17.3
DEC	999.00	31.50	Digital Equipment Corp. (H)	74.75	2.25	3.1
I8M	115.13	73.75	I8M (H)	113.88	4.25	3.9
MDCD	13.00	3.00	Meridian Data Inc. (H)	11.75	-0.50	-4.1
NETF	7.75	4.25	NetFrame	5.25	0.13	2.4
SQNT	25.38	11.25	Sequent Computer Sys. (L)	11.63	0.13	1.1
SEQS	10.00	3.63	Sequoia Systems Inc.	4.88	0.13	2.6
SRA	36.13	23.00	Stratus Computer Inc.	27.38	1.88	7.4
TDM	18.50	9.25	Tandem Computers Inc.	10.00	0.50	5.3
TRCD	6.25	2.00	TriCord Systems	3.00	0.00	0.0
UIS	13.63	5.50	Unisys Corp.	7.38	0.00	0.0
Software						**UP 3.50%**
AD8E	74.25	28.50	Adobe Systems Inc.	38.38	2.38	6.6
AMSWA	8.75	2.88	American Software Inc.	4.63	-0.25	-5.1
APLX	40.75	7.50	Applix Inc. (H)	36.75	2.50	7.3
ARSW	48.50	28.75	Arbor Software	40.63	-0.38	-0.9
ACAD	53.00	27.75	Autodesk Inc.	34.75	5.00	16.8
8ACH	10.75	3.75	8achman Info. Systems	9.38	0.38	4.2
8GSS	42.00	24.75	8GS Systems Inc.	35.25	-1.25	-3.4
8MCS	56.50	27.63	8MC Software Inc. (H)	56.00	0.50	0.9
8OOL	26.38	18.25	8oole and 8abbage	22.50	-0.50	-2.2
8ORL	20.63	7.13	8orland Int'l Inc.	18.63	-0.38	-2.0
CESH	3.94	1.38	CE Software	3.00	0.19	6.7
CYE	27.88	12.38	Cheyenne Software Inc.	21.50	1.25	6.2
COGNF	46.25	16.75	Cognos Inc.	46.25	4.63	11.1
CA	71.63	35.00	Computer Associates (H)	71.63	2.38	3.4
CVN	15.50	4.63	Computervision Corp.	12.50	0.13	1.0
CPWR	39.00	15.50	Compuware Corp.	22.00	4.00	22.2
CSRE	27.25	9.88	Comshare Inc.	23.75	-0.75	-3.1
COSFF	19.50	8.38	Corel Corp.	11.50	0.25	2.2
DWTI	16.25	6.25	Dataware Technologies Inc.	7.25	-0.25	-3.3
DSLGF	32.25	14.13	Discreet Logic Inc.	23.88	-2.63	-9.9
FILE	61.13	30.00	Filenet Corp. (H)	60.25	1.75	3.0
DDDDF	8.25	3.38	4th Dimension	4.44	-0.19	-4.1
FTPS	40.63	10.38	FTP Software Inc.	12.38	0.88	7.6
GSOF	26.00	7.50	Group I Software	7.50	-0.25	-3.2
GPTA	12.25	4.88	Gupta	6.00	0.00	0.0
HOGN	13.88	4.63	Hogan Systems Inc.	11.88	1.69	16.6
HYSW	28.38	14.00	Hyperion Software Corp. (L)	18.25	3.00	19.7
IRIC	18.63	10.00	Information Resources	15.63	1.88	13.6
IFMX	34.38	16.63	Informix Corp.	31.75	2.06	6.9
INGR	20.13	10.00	Intergraph Corp. (H)	19.63	0.88	4.7
LEAF	12.63	4.13	Interleaf Inc.	7.06	-0.31	-4.2
ISLI	26.25	8.75	Intersolv Inc.	12.00	1.88	18.5
INTU	89.25	29.63	Intuit Inc.	59.50	-6.25	-9.5
MGICF	11.50	3.63	Magic Software Enterprises	10.25	0.00	0.0
MANU	20.50	9.50	Manugistics Group Inc.	12.38	2.25	22.2
MAPS	40.00	10.00	MapInfo Corp.	12.75	-0.50	-3.8
MATH	7.38	2.00	MathSoft	5.75	-0.38	-6.1
MCAF	52.88	10.75	McAfee Associates	48.00	1.50	3.2
MENT	22.88	10.88	Mentor Graphics	14.81	1.19	8.7
MIFGY	13.00	8.25	Micro Focus	9.38	-0.13	-1.3
MGXI	15.13	5.75	Micrografx Inc.	13.25	-0.13	-0.9
MSFT	109.25	59.50	Microsoft Corp.	100.00	7.00	7.5
ORCL	51.00	28.00	Oracle Corp. (H)	50.38	1.13	2.3
PMTC	72.56	35.75	Parametric Technology	68.75	5.00	7.8
PARQ	20.00	6.63	ParcPlace Systems Inc.	7.88	0.50	-6.0
PSFT	52.25	16.13	Peoplesoft (H)	51.75	4.75	10.1
PTEC	16.13	6.13	Phoenix Technologies	13.88	0.00	0.0
PSQL	16.88	3.13	Platinum Software (L)	4.25	-0.25	-5.6
PLAT	26.00	11.25	Platinum Technology (L)	12.25	-2.13	-14.8
PRGS	38.00	19.63	Progress Software Corp.	26.75	-1.00	-3.6
RN8O	26.75	15.13	Rainbow Technologies Inc.	22.25	-0.25	-1.1
ROSS	7.75	2.19	Ross Systems	2.81	0.31	12.5
SDTI	64.75	11.88	Security Dynamics Tech. (H)	60.00	2.00	3.4
SKEY	51.75	13.38	Softkey International Inc. (L)	19.38	3.25	20.2
SPCO	5.13	2.19	Software Publishing Corp.	3.13	0.19	6.4
SOTA	12.50	6.63	State of the Art	10.75	0.13	1.2
SSW	62.63	32.88	Sterling Software Inc. (H)	60.88	-0.25	-0.4
SDRC	31.13	6.00	Struct. Dynamics Research (H)	29.50	0.75	2.6
SY8S	47.50	19.88	Sybase Inc.	32.13	-1.00	-3.0
SYMC	33.25	9.88	Symantec Corp.	13.13	0.31	2.4
SNPS	38.50	22.63	SynOpsys	33.88	4.25	14.3
SSAX	30.63	12.00	System Software Assoc.	26.00	2.00	8.3
SYSF	18.13	7.75	Systemsoft Corp.	12.38	-1.50	-10.8
TRUV	10.13	3.63	Truevision Corp.	5.50	0.38	7.3
VIEW	15.13	8.38	ViewLogic Systems	10.75	0.13	1.2
VMRK	21.50	5.75	VMark Software Inc.	8.25	0.25	3.1
WALK	11.00	4.63	Walker Interactive Systems (H)	11.00	2.75	33.3
WALL	55.50	13.00	Wall Data Inc.	14.63	-0.63	-4.1
WANG	19.50	11.13	Wang Laboratories Inc.	18.13	-0.69	-3.7
Internet						**UP 1.46%**
AMER	49.88	15.00	America On-Line (H)	49.88	5.38	12.1
NETC	91.50	19.00	Netcom On-Line	29.00	-0.38	-1.3
NSCP	87.00	22.88	Netscape Comm. Corp.	66.00	-8.50	-11.4
QDEK	39.50	3.38	Quarterdeck Corp.	16.63	0.13	0.8
SPYG	61.00	13.25	Spyglass Inc.	36.25	-0.50	-1.4
UUNT	98.75	21.75	UUNET Tech.	41.25	3.75	10.0
Semiconductors						**UP 1.71%**
AMD	39.25	16.13	Advanced Micro Devices	20.50	0.38	1.9
ADI	28.38	14.63	Analog Devices Inc. (H)	28.38	5.00	21.4
CHPS	15.88	6.25	Chips and Technologies	9.38	0.38	4.2
CRUS	61.13	14.88	Cirrus Logic	23.88	2.00	9.1
CY	27.75	10.00	Cypress Semiconductor Corp.	14.75	0.50	3.5
INTC	78.38	36.38	Intel Corp.	57.88	1.13	2.0
LSI	62.50	22.50	LSI Logic Corp.	34.25	1.00	3.0
LSCC	43.00	22.25	Lattice Semiconductor	33.38	1.13	3.5
MCRL	32.50	12.50	Micrel Semiconductor Inc.	17.00	-1.13	-6.2
MU	94.75	22.25	Micron Technology	38.63	2.63	7.3
MOT	82.50	44.75	Motorola Inc.	55.50	-0.25	-0.4
NSM	33.63	14.88	National Semiconductor	16.63	-1.00	-5.7
SERA	28.75	9.00	Sierra Semiconductor	18.25	-1.75	-8.8
TXN	83.75	12.75	Texas Instruments	50.00	2.00	4.2
VLSI	39.13	12.13	VLSI Technology	14.63	-0.44	-2.9
WWTK	6.88	1.88	Weitek	2.38	-0.38	-13.6
WDC	22.13	13.13	Western Digital Corp.	19.38	0.75	4.0
XLNX	55.50	20.38	Xilinx	43.38	2.25	5.5
ZLG	54.13	28.50	Zilog Inc.	38.25	0.25	0.7
Peripherals and Subsystems						**UP 0.44%**
APCC	25.88	7.88	American Power Conversion	8.50	-0.13	-1.4
ADPT	50.63	29.00	Adaptec Inc. (H)	47.13	2.88	6.5
C8EX	13.13	3.50	Cambex Corp.	6.25	-0.38	-5.7
CGN	7.25	2.13	Cognitronics Corp.	5.25	0.13	2.4
CNR	26.38	9.25	Conner Peripherals	25.75	0.00	0.0
CREAF	14.13	5.88	Creative Technologies Inc.	8.50	0.44	5.4
RACE	13.13	3.63	Data Race Inc.	4.50	0.38	9.1
DTM	9.38	4.50	Dataram Corp.	5.00	-1.50	-23.1
EMC	27.38	13.00	EMC Corp.	18.00	-0.50	-2.7
EMLX	28.50	6.38	Emulex Corp.	11.00	-0.13	-1.1
ESCC	25.25	12.00	Evans and Sutherland	23.00	1.50	7.0
EX8T	19.25	10.00	Exabyte	13.75	-0.13	-0.9
IISLF	4.25	1.56	Intelligent Info. Systems	1.63	0.00	0.0
IOMG	18.00	1.75	Iomega Corp.	14.38	1.38	10.6
IPLSA	7.88	2.50	IPL Systems Inc.	4.13	0.50	13.8
KMAG	37.50	11.50	Komag Inc.	30.25	1.00	3.4
MLIS	10.13	2.63	Micropolis Corp. (L)	2.63	-0.44	-14.3
MTSI	37.75	11.25	Micro Touch Systems Inc.	13.75	0.50	3.8
PEAK	34.75	16.75	Peak Technology Group	20.75	1.50	7.8
PNCL	19.75	5.88	Pinnacle Micro Inc.	13.25	-1.00	-7.0
PTNX	38.75	13.50	Printronix Inc.	17.75	-3.50	-16.5
AQM	8.00	3.25	QMS Inc.	5.38	0.25	4.9
QNTM	28.50	13.75	Quantum Corp.	17.75	-0.38	-2.1
RDUS	14.38	1.44	Radius Inc. (L)	1.75	0.13	7.7
SEG	61.75	23.63	Seagate Technology (H)	58.38	-0.13	-0.2
STK	30.13	17.88	Storage Technology	27.38	0.25	0.9
TEK	61.88	31.38	Tektronix Inc.	44.38	-0.50	-1.1
XRX	144.63	106.63	Xerox Corp.	131.63	6.38	5.1
Services						**UP 5.76%**
AMSY	23.25	11.38	American Mgmt. Systems	22.00	0.19	0.9
ANLY	33.00	20.00	Analysts Int'l	30.75	1.75	6.0
AUD	42.13	30.25	Auto Data Processing	42.13	1.88	4.7
CATP	61.00	25.00	Cambridge Tech. Partners	45.75	-4.25	-8.5
CEN	47.50	29.25	Ceridian Corp.	45.75	1.63	3.7
CDO	23.75	16.38	Comdisco Inc.	22.13	0.75	3.5
CHRZ	30.00	6.38	Computer Horizons (H)	29.50	2.50	9.3
CSC	79.38	46.50	Computer Sciences	78.63	1.50	1.9
TSK	22.00	9.50	Computer Task Group	18.63	0.63	3.5
CPU	44.38	17.50	CompUSA Inc.	34.88	-0.13	-0.4
CDAT	21.38	6.50	Control Data Systems Inc.	17.19	-0.69	-3.8
EGGS	14.25	5.00	Egghead Discount Software	6.75	0.06	0.9
GME	57.38	37.50	General Motors E (EDS) (H)	55.75	-0.88	-1.5
INAC	16.25	7.88	Inacom Corp.	15.88	0.25	1.6
INEL	14.63	3.50	Intelligent Electronics (L)	7.13	2.63	58.3
MSEL	8.38	2.75	Merisel (L)	4.25	0.88	25.9
MICA	15.00	7.25	Microage Inc.	10.00	0.38	3.9
PAYX	57.50	25.88	Paychex (H)	57.25	4.25	8.0
PMS	54.25	41.50	Policy Management Sys.	50.38	2.38	4.9
REY	39.63	24.13	Reynolds and Reynolds	38.13	0.00	0.0
SEIC	24.50	16.75	SEI Corp.	24.25	2.13	9.6
SMED	58.00	32.00	Shared Medical Systems (H)	54.88	1.44	2.6
SSPE	26.50	14.88	Software Spectrum Inc.	18.75	-0.25	-1.3
SNDT	35.50	18.88	Sungard Data Systems (H)	34.00	3.00	9.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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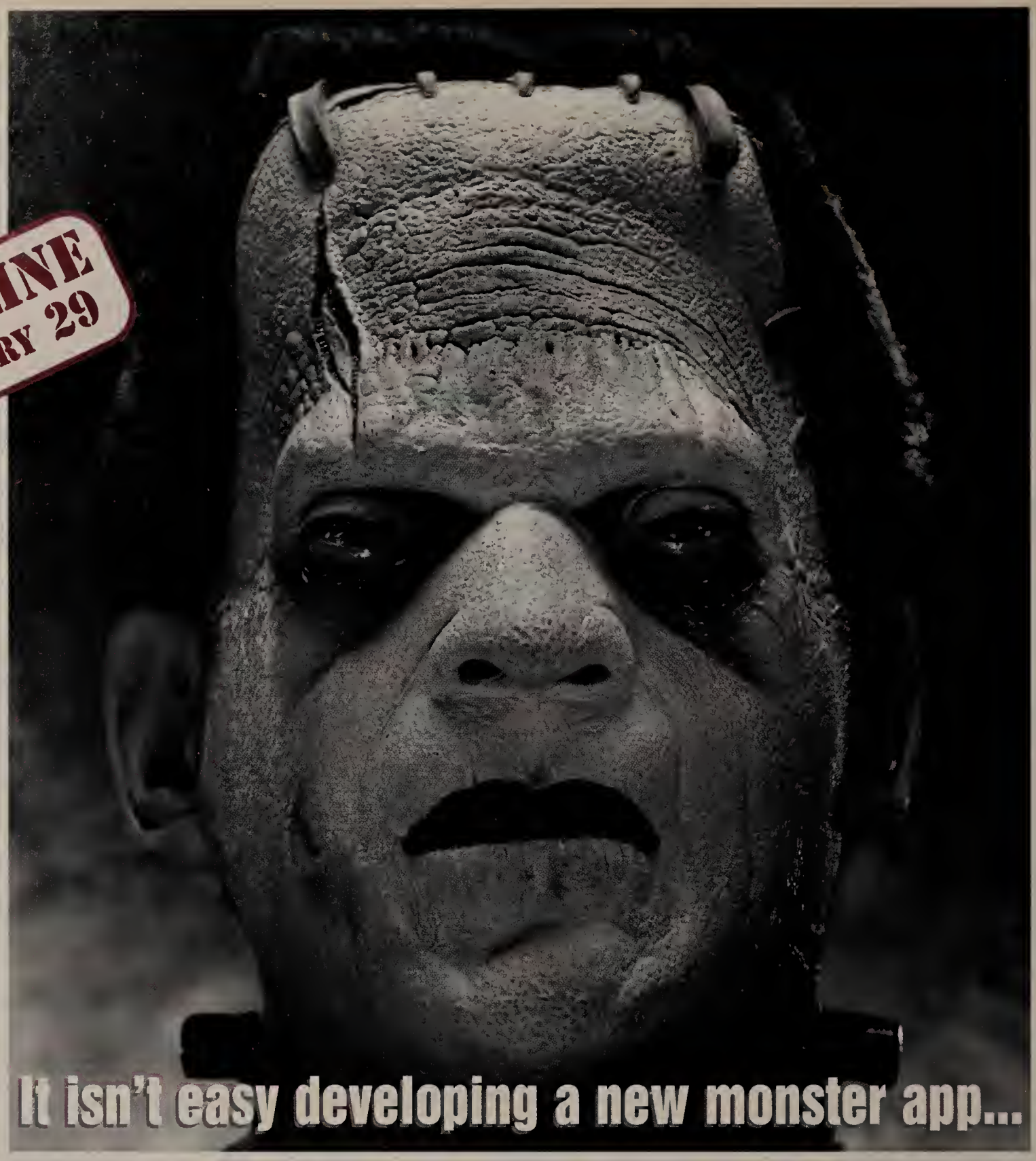

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SCO, HP pitch unified Unix

CONTINUED FROM PAGE 1

put much pressure on Sun and IBM, Hurley said. "I was more than a little taken aback by their chutzpah, but there are parts of this that just don't make sense."

In the coming months, the sources said, second-tier server vendors such as Unisys Corp. and ICL are expected to disclose plans to gradually do away with their Unix kernels and standardize on SCO's UnixWare technology. That would carry over into the joint SCO/HP technology.

ICL is looking at running the software on its SPARC-based systems, and PowerPC ports are also being discussed, the sources said. SCO and HP are flaunting the multiplatform support by calling their operating system a "unified Unix" — a term that has long been used to refer to the pipe dream of a single Unix operating system.

But getting users to buy that story won't be easy.

Rather than unify Unix, the SCO/HP combination just sounds like "another bloc within the industry," said Brian Slater, managing director at the Global Banking Division of Chemical Banking Corp. in New York. "It clears the field up somewhat, but HP is the only real player in the marketplace in that group," Slater said.

Consolidating the many flavors of Unix on the market "is a nice concept, but it's not something I'm going to lie awake worrying about," said Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. The supermarket cooperative uses HP, IBM and NCR Corp. servers.

From a competitive standpoint, HP, SCO and their fellow travelers constitute a formidable presence, particularly at the server level. Their combined share of server operating system shipments last year exceeded 50%, according to preliminary figures from International Data Corp. in Framingham, Mass. Sun had a 13% share, and IBM came in at 11%.

Officials at NEC declined to comment specifically about a MIPS port of the SCO/HP operating system. But a spokeswoman said NEC and other vendors of MIPS-based systems "are putting an initiative in place to support what HP and SCO are doing."

The road ahead

Sun and the SCO/HP team plan the following operating system developments

Sun

Midyear: 64-bit kernel I/O for large memory-to-disk transfers

Early 1997: Support for 64-bit file sizes of up to 1T byte

Early 1998: Full 64-bit Solaris kernel, addressing and file system

SCO/HP

Now:
- SCO UnixWare 2.1 with NetWare 4.1 integration
- HP-UX 10.10 with 128G-byte file sizes

May/June: SCO OpenServer upgrade with 4G bytes of addressable memory

Third quarter: Unified development tool kit for UnixWare and OpenServer

1997:
- Merged UnixWare/OpenServer release, code-named Gemini
- Full 64-bit version of HP-UX

1998: 64-bit combination of Gemini and HP-UX for Intel/HP P7 architecture

Too close for comfort

Unix and Windows NT are forming an intimate relationship that should make Microsoft Corp. and Unix server vendors equally uncomfortable.

Softway Systems, Inc. in San Francisco will announce at UniForum '96 that it plans to layer a Unix environment on top of Windows NT.

The OpenNT software, which is being released in stages through mid-1997, will let users of NT-based servers run Unix applications alongside 32-bit Windows programs.

OpenNT is being developed under a contract with Redmond, Wash.-based Microsoft, which wants to ensure that Windows NT meets federal government requirements for Posix compliance, said Doug Miller, Softway's CEO.

But Microsoft wants no part of marketing the Unix layer, he said.

Michael Goulde, an analyst at Patricia Seybold Group in Boston, said OpenNT "directly competes with Microsoft's stated mission, which is to have everybody write applications to Win32."

Win32 is the application programming interface used by Windows NT and Windows 95.

The Softway product also puts Unix vendors in a bind because customers will have an easier migration path to NT-based hardware.

"It's going to force a lot of people to do some thinking," Goulde said.

— Craig Stedman

NT potholes delay users

CONTINUED FROM PAGE 1

with their own work-arounds.

Mike Nash, Microsoft's group product manager for Windows NT Server, last week acknowledged that there are flaws in the management functions.

He said the Redmond, Wash., firm "will absolutely fix any of the gaps that exist in Windows NT Server to ensure that our administrative tools map even more closely to the needs of MIS managers."

Functions missing

In some instances, such as with the Domain Naming System, Microsoft already has fixes in the works. In other cases, Nash said perceived problems are attributable "to the natural learning curve. Everything you can do in NetWare is also manageable in Windows NT Server," he said.

The shortfall in management functionality has delayed the installation of Windows NT Server at Chevron Information Technology Co. in San Ramon, Calif. Kiran Movva, Chevron's base technologist for networks, said his company was stumped by the inability to easily locate user IDs and view the complete list of all the applications and devices on the network that users can access.

"This is easily accomplished in NetWare, but in NT Server I have to go into File Manager, highlight each direction, select the Permissions Object and repeat that process for each different directory," Movva explained. "It's so tedious; we don't even attempt it."

Users and analysts said NT Server lacks a core group of about a half-dozen key management functions, including the following:

- The ability to set disk quotas. Without them, the server could become overwhelmed and cause the network to crash.
- The ability to easily find and access a complete list of user trustee rights.
- A Simple Network Management Protocol Management Information Base (SNMP MIB) Catcher. This tool uses SNMP functions to gather and change data in the MIBs for devices on the network, essential for gathering statistics on the health of the network.
- The Domain Naming System component. This software allows businesses to connect to the Internet from a Windows NT network and an Internet Mail Server.

Network management

The NT Server management issues are further complicated by the relative newness of the system, which has been shipping since 1993.

Many businesses are unfamiliar with the environment, and that is partly to blame for some of the management woes, said Pete Cahill, server systems analyst at Osram Sylvania, Inc. in Danvers, Mass. "Many users migrating from NetWare to Windows NT Server don't know enough yet to understand what tools are available and how to apply them," Cahill said.

NT Server accounts for 15% of all network operating systems installed. Analysts predict that if NT Server's momentum continues at its present pace, that percentage could rise to about 30% this year. The Yankee Group in Boston recently surveyed information technology organizations about their perceptions of NT Server. The top concern was scalability, followed closely by systems management.

"They didn't like the fact that this systems management story really isn't complete yet," said senior analyst Brian Murphy. "This remains an obstacle to massive adoption of Windows NT Server vs. Unix."

"NT hasn't been out long enough to have a tool chest like NetWare for remote monitoring, backup and other tasks," said Carl Phillips, a technical specialist at BSG Alliance IT, Inc. in Austin, Texas. Many of the tools are shareware or public domain, he said.

Indeed, rolling out more than 1,000 copies of Windows NT Server to field offices has frustrated one user. "NT just isn't all that manageable," said the executive, who asked to remain anonymous. "For example, we can't remotely see what's running on a machine by typing a simple command, like we do with Unix."

Still, some users and analysts gave Microsoft high marks for effort. "The basic NT Server management utilities are pretty good for a first effort. Only a limited number of third-party applications are shipping," said Mark Minasi, author of *Mastering Windows NT Server 3.51*, and president of Tech-Teach International, a technical consulting firm in Arlington, Va. "By contrast, users can buy a NetWare NLM application [from a third party] that will tie your CEO's shoes."

Author offers work-arounds

There is a quick fix for users who have encountered two of the most vexing network management quandaries in Windows NT Server — easy access to the complete list of user trustee/access rights and the ability to have Internet mail connectivity from Windows NT Server networks. Mark Minasi, an expert user who authored *Mastering NT Server 3.51*, says network administrators can get a list of their users' trustee/access rights by implementing CACLS, a little-known Command Line Routine that is embedded in the Winnt35\system32 directory.

To access the routine, type CACLS and the name of the directory and hit enter, and it will give you the list of permissions, Minasi said. Users can turn their Windows NT networks into an Internet post office by downloading a freeware program from the European Microsoft Windows Academic Center in the U.K. at http://clyde.emwac.ed.ac.uk/html/internet_toolchest/ims/ims.html.

— Laura DiDio

A new tool should ease the pains of TCP/IP address management. See page 55.

Apple should sell itself . . . to Microsoft

Charles Babcock

Amgen is a Fortune 500 company that got there without ever buying an IBM mainframe. It bought Apple computers — a total of 4,500 Macintoshes, to be exact. The Applc PCs support the genetic engineering firm's worldwide operations, but that business decision is giving Amgen IS officials second thoughts.

Amgen didn't buy Macintoshes just to supplement its Intel-based PCs. With a scant 300 Intel and Windows PCs, Amgen was one of the few companies to standardize its desktop on the Macintosh.

Apple's ouster of CEO Michael Spindler and the hiring of turnaround artist Gilbert Amelio has one of Apple's best customers wondering whether it should finally throw in the towel and move to Windows.

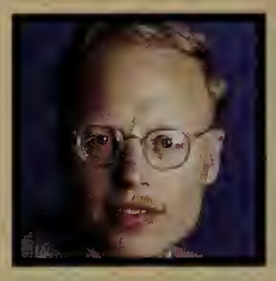
If Apple is going to refocus on its core markets in education, desktop publishing and home computing, "it's not a comfortable position" for Amgen, said Larry May, controller and supervisor of IS at Amgen in Thousand Oaks, Calif. "I'd rather hear that they are selling the company to someone who could take the power of the Mac operating system and leverage it," May said.

But that someone better not be Sun Microsystems, Apple's would-be suitor. May said Sun, as another hardware manufacturer, wouldn't have capitalized on the Macintosh operating system any more than Apple has. As a hardware manufacturer, Apple has no special strengths and many weaknesses. Likewise, Sun could scarcely be expected to focus solely on the Macintosh operating system.

May said Apple must focus on its strength as a producer of creative software. But it needs to do so as a full-fledged competitor and not turn its back on the business market, which is what Amelio is expected to do.

With losses mounting, is Amelio likely to invest in Apple's foray into commercial computing? The Macintosh's position has been eroding there for years. As Windows 95 starts to take hold, the Macintosh will have a much stronger competitor against which to reestablish itself. Then there's Apple's strategy of selling servers to business, a move that fell dismally flat.

The Meta View



Amgen, with 4,500 Macintoshes, sees a vendor in shambles.

I called May the day after the new Apple CEO was named and found him contemplating what was left of Apple's position as a computer company.

He said what he saw was a shambles.

To remain an Apple customer, May said he must be assured that Apple will continue to address the applications and systems software needs of business customers.

If Apple's focus narrows to education/desktop publishing/home computing, "we have to consider making the move," he said. Moving to Windows, that is.

By moving to Windows, a wider selection of business software would become available. An Apple retrogression to earlier markets "will be a disaster for Apple's business base. We now have to put in place disaster recovery measures," which means having contingency plans ready for a move to Windows, May said.

There is a way out for the beleaguered Apple and that is to be acquired by a company that knows how to leverage a software product. Who's that? I asked, as I scanned my memory banks and came up with no candidates.

"Microsoft," he said. "Microsoft would be able to take the Apple assets someplace."

They'd like to take the Mac OS and bury it, I said. It's made their nameplate look bad for years.

Microsoft shouldn't be that way, May answered. "Chrysler had the choice to continue building sport utility vehicles or [buy] Jeep. They bought Jeep and saved billions of dollars." Apple's assets would save Microsoft millions of dollars of continued development expense on Windows, he said.

There you have it. Apple's salvation, in the eyes of one of its leading customers, is to be put at the tender mercies of a rapacious rival. Keep those contingency plans handy.

* * *

A reader responds: You wrote concerning Apple, "How much would you pay for a company that's losing money and whose $300 million debt was just declared to be of junk bond status?" ["Apple: A name with cachet, but who's to pay?" CW, Feb. 5]

"The real question should have been, 'How much would you pay for a company that has gross sales of $12 billion, sells 5 million to 6 million computers a year, has $1 billion cash in the bank and, because of price cutting by others, lost a mere $68 million last quarter?' "

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Bay back on the acquisition trail?

A source within internetworking giant Bay Networks, who requested anonymity, last week said the company is in the midst of negotiations to acquire XArmon Networks in Santa Barbara, Calif. A Bay spokeswoman confirmed that the company plans to "make an announcement in the next couple of weeks, probably about an acquisition," but she would provide no other details. Officials at XArmon, a maker of network management products, declined comment.

First Amendment be darned . . .

Although Yahoo, Netcom and dozens of other Internet vendors supported last week's Web site blackout, quite a few heavy hitters didn't. The idea was to color Web pages black in protest of the Clinton administration's telecom law, which stomps on the First Amendment free-speech rights of on-line users. But Oracle and Microsoft, which have bombarded us with marketing messages that proclaim how tuned in they are to Internet culture, didn't show one lick of support for the protest at their Web sites. Not coincidentally, Oracle and Microsoft are vocal supporters of deregulating the telephone and cable industries so they can sell their software in the anticipated frenzy.

. . . and 24 hours lost in space

This past Thursday was "A Day in the Life of Cyberspace," a worldwide publicity frenzy designed to celebrate the 21st-century technology of the Internet and online services. We at *Computerworld* fully endorsed this fine commemoration, and here's how we participated: We downloaded *Simpsons* MPEGs from the Web. Then we went home and watched *Friends* and *E.R.* (Um, does TV count as cyberspace?) Anyway, we're all exhilarated from being a part of this experience, which was even better than "Hands Across America" in that you can do this one sitting down.

Wake up and smell the cybercoffee

At least one guy said he believes that technology has already delivered abundant leisure time and improved productivity. Richard Mandelbaum, chairman and president of the New York State Education and Research Network, spoke at a conference about electronic commerce last week in New York. He told the gathering that technological advances "have led to three-day weekends and 35- to 40-hour work weeks," which the Internet will only extend for us. The audience roared with laughter.

Drive-by E-mailings

The battle of good vs. evil on the Internet has escalated. Members of a group dubbed Darkspace use mass E-mail messages to clip the wings of the CyberAngels, volunteers who patrol Internet chat channels and newsgroups. For months, this offshoot of the Guardian Angels has suffered "E-mail bombings" by its nemesis, whose members apparently loathe the do-gooders' presence and the Angels' tips to authorities that prompt investigation and negative publicity about the seamy underside of the Internet. CyberAngels officials said their server repeatedly gets swamped by thousands of messages due to forged subscriptions to list servers.

Thinking something a little different might be in order this Valentine's Day, we gave a look-see to the "Exciting Experiences of Love" computer game made by Relationship Software in Orem, Utah. We can't say it was really our kind of thing, but it did present some amusing moments. A command to "sensuously striptease" for your mate was accompanied by a photo of a woman holding a balloon and wearing a clown suit (complete with big red nose). Um, was that supposed to get us in the mood? If you know of any other strange techno-matches, please contact Computerworld's *24-hour tip line at (508) 820-8555 or our toll-free number at (800) 343-6574. News editor Maryfran Johnson can be reached at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*

The 5th Wave by Rich Tennant

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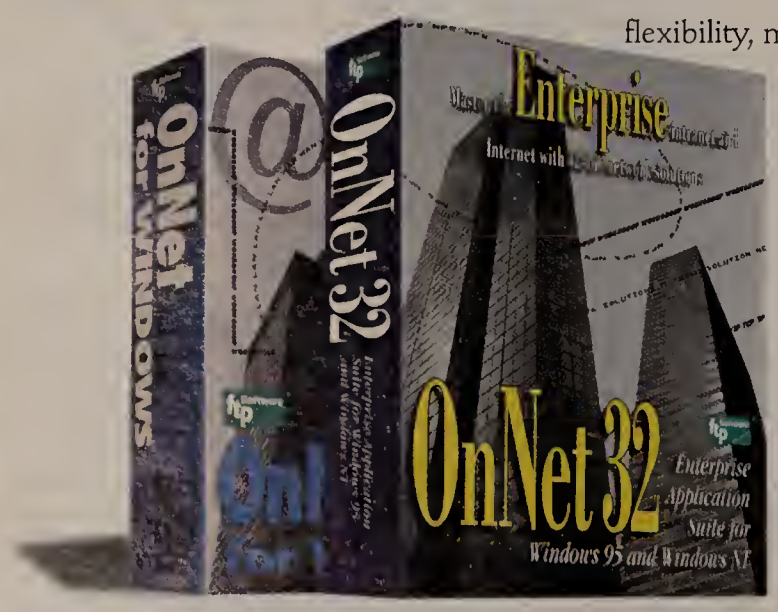

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